THE INDUSTRIAL-ARTS MAGAZINE

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JUNE 1923

The Bruce Publishing Company
Milwaukee, Wis.

ATKINS
SILVER STEEL SAWS

IN ATKINS SAWS YOU GET REAL TAPER GRINDING— NOT AN IMITATION

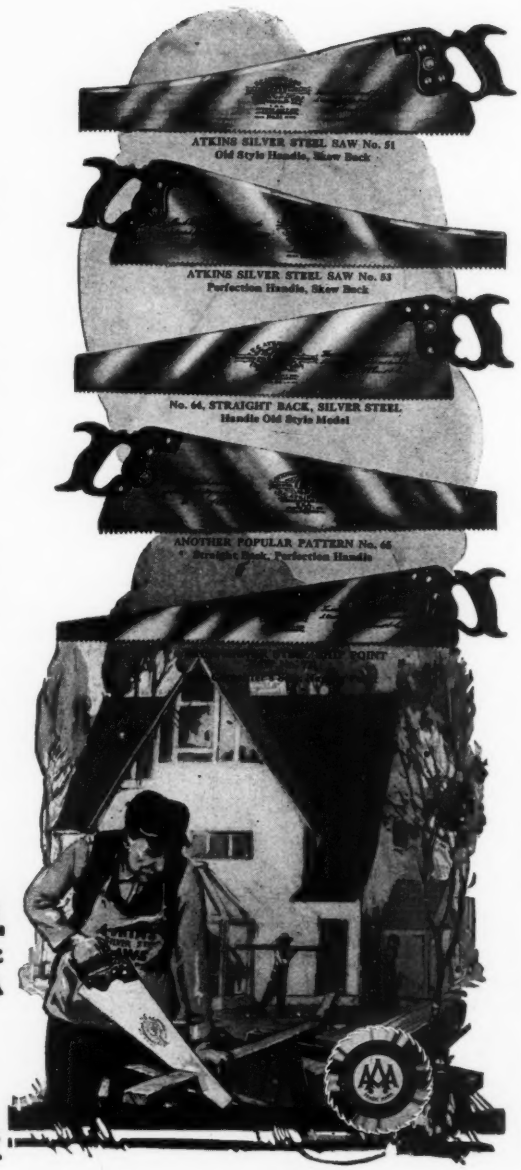
When a saw "binds" it's the fault of the saw, not the sawyer; except, of course, the sawyer was to blame for buying the wrong saw.

ATKINS Silver Steel SAWS

are ground to a taper, from the teeth to the back, then tapering on the radius of a circle; the thickest part is at the handle and tapering to the point, the thinnest part. In other words, the taper is from teeth to back and from heel to point. That's what makes Atkins Saws cut free and easy.

We furnish them in regular or ship point widths, straight or skew back, equipped with old style block handle or the latest and most scientific handle—the handle that eliminates wrist strain—the Improved Perfection.

FREE—Write for "Saw Sense," the book of facts, also educational literature, "How To Care For And Use Cross Cut And Hand Saws," for use of your classes.


ATKINS SILVER STEEL SAW No. 51
Old Style Handle, Skew Back
ATKINS SILVER STEEL SAW No. 53
Perfection Handle, Skew Back
No. 64, STRAIGHT BACK, SILVER STEEL
Handle Old Style Model
ANOTHER POPULAR PATTERN No. 66
Straight Back, Perfection Handle

E.C. ATKINS & CO.

ESTABLISHED 1857 **THE SILVER STEEL SAW PEOPLE**

Home Office and Factory, INDIANAPOLIS, INDIANA

Canadian Factory, Hamilton Ontario

Machine Knife Factory, Lancaster N.Y.

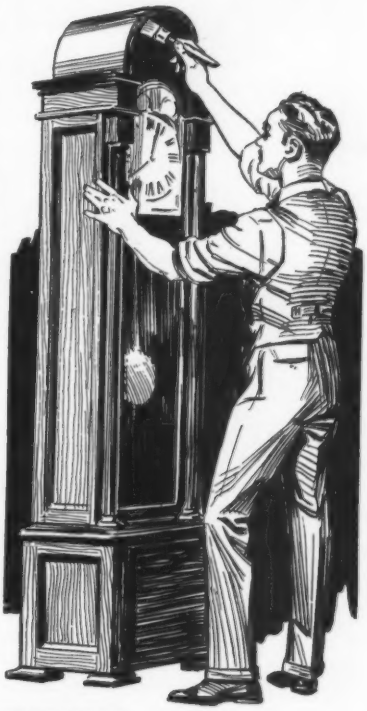
Branches Carrying Complete Stocks In The Following Cities:

Atlanta	New Orleans	Seattle
Memphis	New York City	Paris, France
Chicago	Portland, Ore.	Sydney, N. S. W.
Minneapolis	San Francisco	Vancouver, B.C.

Choosing the Proper Finish Is Important

Johnson's Artistic Wood Finishes are now being used in nine tenths of the schools in United States and Canada. They are particularly adapted for manual training work as they may be applied by the youngest and most inexperienced pupils with good results.

JOHNSON'S *ARTISTIC* WOOD FINISHES



The finishing of manual training models is assuming more and more importance every year. Surely it is a subject which should be given its share of attention, for a beautiful model may be ruined if improperly finished, whereas the defects of a poorly constructed model are minimized if well finished.

The finishes more popular among Training Instructors and Pupils are: Johnson's Wood Dye, Prepared Wax, Under Lac, Paste Wood Filler, Varnishes, Undercoat and Enamel.

Johnson's Artistic Wood Finishes are very easy to use. Boys in the Fifth and Sixth grades can use them successfully. Simple instructions are printed on every label.

FREE—Book on Wood Finishing

Our Book is a valuable text book on Wood Finishing and should be in the hands of every instructor of Industrial and Vocational Education. It is full of information on finishing all wood—hard or soft—old or new. Tells how inexpensive soft wood, such as pine, cypress, fir, etc., can be finished so they are beautiful as hardwood.

This Book is the work of experts — profusely illustrated in color — includes color charts — gives covering capacities, etc. New edition is just off the press. We will gladly send it free.

Submit Your Problems to Our Individual Service Department

We have a very attractive exhibit of wood panels finished with these products which we are glad to send, free and postpaid, to Manual Training instructors who will give it wall space in their shops.

At all times we are glad to furnish Manual Training Instructors with specially finished panels of wood for class room use, also with working samples. There is no obligation whatever connected with this offer. Don't hesitate to avail yourself of it.

S. C. JOHNSON & SON, Dept. I.A.-6, RracINE, WIS. (Canadian Factory — Brantford).

Please send me free and postpaid your text book on Wood Finishing. We usually buy finishing materials from

Dealer .....

My Name.....

My Address.....

City and State.....

Hand Drill
No. 5½
Price $5.

Mr. Punch says:
"Give a student this hand drill and see how easily he handles a job."

A drill that stands hard usage

NO fear of students getting this drill out of order or harming its mechanism. This drill is simplicity itself.

Takes all sizes of round-shank drills up to 3/8". No play in the spindle. Equipped with ball bearings. Malleable iron frame, handsomely black enameled.

Has two speeds, making it adaptable for work on all kinds of materials. Easy to operate.

Other tools for school work

This hand drill is just one of many Goodell-Pratt 1500 Good Tools that will help your students do good work and develop rapidly.

Learn more about Goodell-Pratt Tools. Write now for free catalog No. 15, which shows the many tools appropriate for school shops.

GOODELL-PRATT COMPANY
Toolsmiths
Greenfield, Mass., U. S. A.

GOODELL-PRATT
1500 GOOD TOOLS

WILLIAMS' "AGRIPPA" TOOL HOLDERS

"THE HOLDERS THAT HOLD"

Standard everywhere for all machining operations.

Designed for heavy cuts at high speeds, Williams' "AGRIPPA" Tool Holders have many unique features that make for convenience and economy. Add their prestige to your line.

Machinists' Tools Book on Request

J. H. WILLIAMS & CO.
"The Drop-Forging People"
BROOKLYN BUFFALO CHICAGO

MAYDOLE HAMMERS
THE WORLD'S STANDARD

There are none better made—none better known. When you buy these hammers, you are certain of getting the best. They are used the world over.

Maydole Hammers are made of finest quality material, and guaranteed first-class in every respect.

Write for our booklet of useful information, which every student should have. How many shall we send?

The David Maydole Hammer Company
NORWICH NEW YORK U. S. A.

THE JOHNSON FRICTION CLUTCH

INSTALLED on LINE SHAFTING

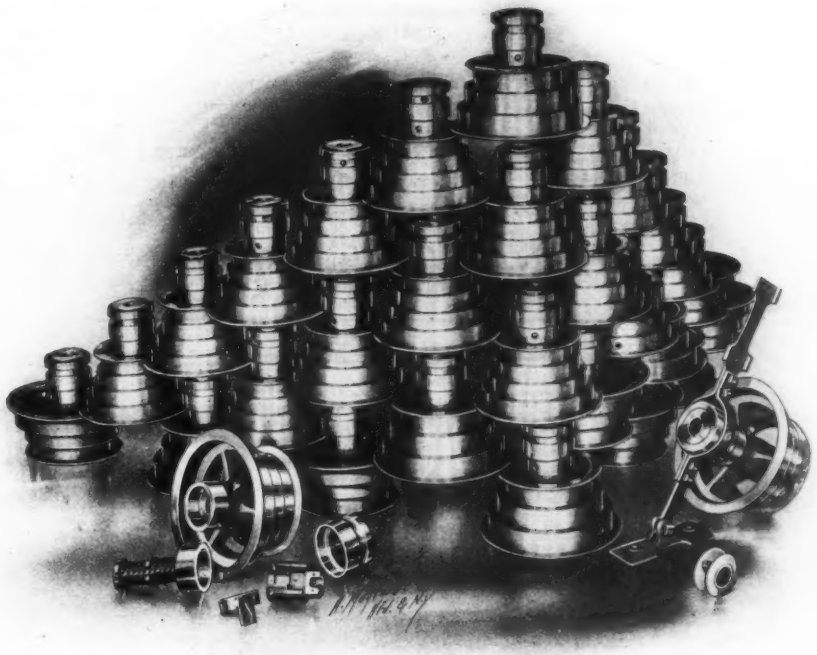
in

THE TECHNICAL HIGH SCHOOL

Springfield, Mass.

has been driving WOOD-WORKING LATHES for the past 15 years, and are still operating satisfactorily.

The illustration below shows a quantity of **Johnson Clutches** with four step cone pulley mounted on the clutch hubs which were shipped to them at that time.



Courtesy: The Technical High School, Springfield, Mass.

Johnson Clutches soon pay for themselves by the saving in power, pulleys, counter shafts, overhead belting and other unnecessary equipment.

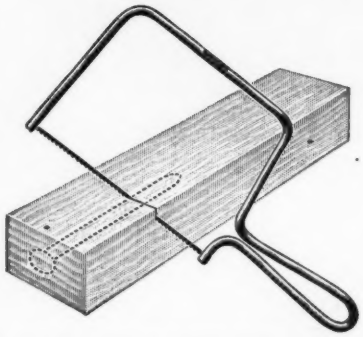
Standard slow speed clutches are carried in stock for immediate shipment.

High speed clutches are made to meet each particular condition and deliveries are very good.

Write for "IAM" Catalog.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER, CONN.

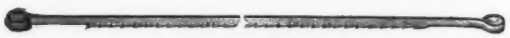
GRIFFIN
COPING SAW BLADES



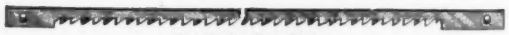
Will stand the most severe tests, even cutting right through nails imbedded in wood.

Every GRIFFIN BLADE is carefully hardened to give long service. The teeth have a distinct "set" for easy clearance, which prevents heating, binding and breakage.

HAVE SHARP TEETH and GOOD TEMPER



6 inch—Loop Ends



6½ inch—Pin Ends
Also furnished in 6 inch.

MANUAL TRAINING INSTRUCTORS
who have used the Griffin Coping Saw Blades for many years testify to their uniformly high quality, good temper, and well "set" teeth.

THEY ARE GOOD JUDGES

ALWAYS SPECIFY "GRIFFIN" Coping Saw Frames and Blades.

Your Dealer will supply you—if not, write us.

Sales Department

113 Chambers Street NEW YORK JOHN H. GRAHAM & CO. **268 Market Street San Francisco, Calif.**

DURABILITY — ACCURACY — STRENGTH
are striking features of
Westcott Chucks

Spur Geared Scroll Combination Lathe Chuck

They are as essential in the schoolroom as in the commercial shop. The student who learns his trade using the very best of tools and equipment, is sure to benefit in the end.

In the case of chucks—
BUY WESTCOTT

Little Giant Double Grip Drill Chuck

Mainly About Your Classes

If you are not using Westcott Chucks now, you should certainly give your boys this advantage. Their best work can only be accomplished on the best equipment. Specify Westcott Chucks on your next order—in the meantime send for our catalogue.

Manufacturers of chucks for every class of work.

WESTCOTT CHUCK COMPANY
Oneida, New York

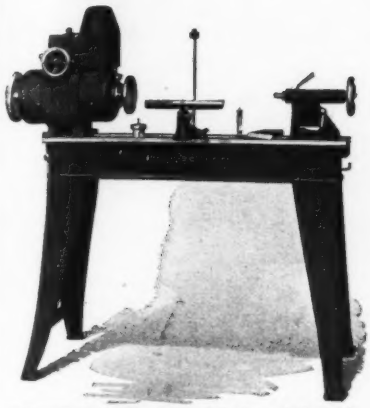
"STAR"
Hack Saws

Want the Best?
TRY IT

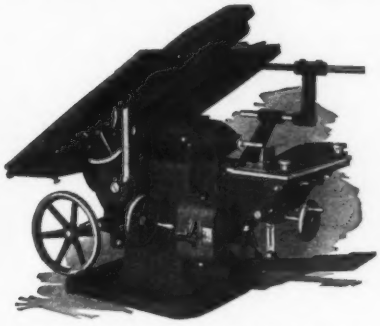
CLEMSON BROS., Inc.
MIDDLETOWN, N. Y.
Makers Since 1883

"Oliver" Beltless Woodworking Machinery

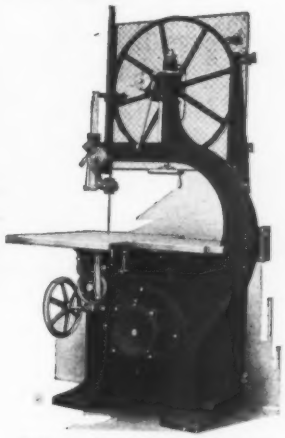
For the Modern Manual Arts Department



"Oliver" Motor Head Speed Lathe. Adjustable Speeds for Direct or Alternating Current



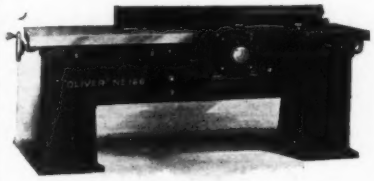
"Oliver" No. 80 Motor-Arbor Saw Bench



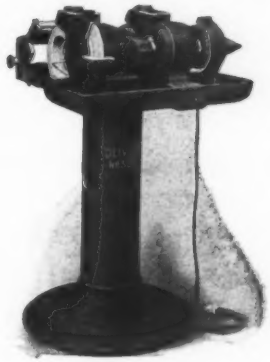
"Oliver" Motor-on-shaft Band Saw

SOME ADVANTAGES

1. Safer to operate.
2. Saves floor space.
3. Belts eliminated.
4. Simpler.
5. Easy to install.
6. Less upkeep.
7. Saves power.
8. Efficiency increased.
9. Lighter shops.
10. Improves appearance of shop.



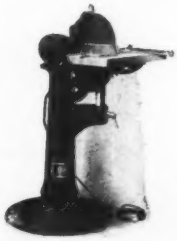
"Oliver" No. 166 Hand Planer and Jointer



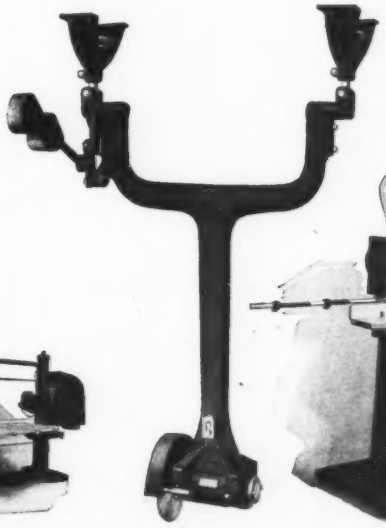
"Oliver" No. 585 Motor Spindle Oilstone Grinder

Oliver Machinery Co.
Grand Rapids, Mich., U.S.A.

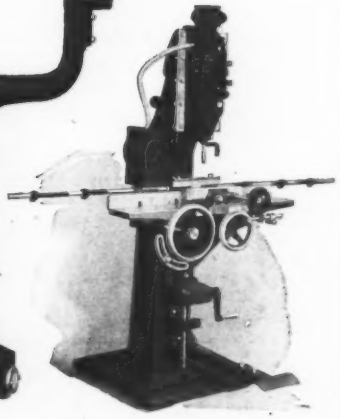
"Oliver" No. 173 Direct Motor Driven Jig Saw or Scroll Saw



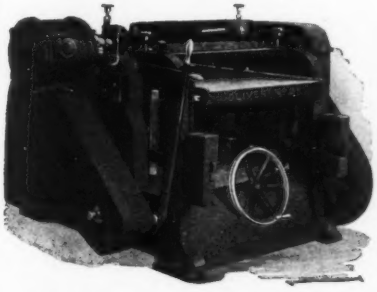
"Oliver" Direct Motor Driven Disk Sander



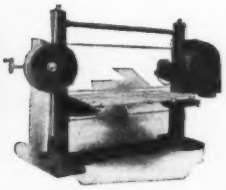
"Oliver" Motor-Arbor Swing Saw



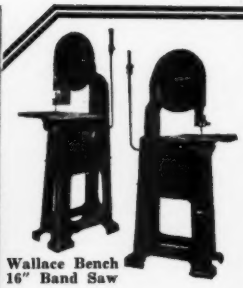
"Oliver" Motor Spindle Hollow Chisel Mortiser



"Oliver" No. 61 Surface Planer. Motor is Mounted on Cylinder



"Oliver" No. 184 Beltless Belt Sander



Wallace Bench
16" Band Saw

Wallace Bench Universal Saw
Wallace Bench Plain Saw
Wallace Bench 16" Band Saw
Wallace Bench 6" Jointer
Wallace Bench 4" Planer
Wallace Bench 6" Lathe
Wallace Bench Glue Pot with Automatic Heat Control
Wallace Bench Solder Pot with Automatic Heat Control

Adopt Modern Methods

Over 500 school woodworking shops have installed Wallace Bench Machines to enable their students to familiarize themselves with the latest developments in the woodworking industry.

The accuracy of these machines and the ease and safety with which they can be operated aid materially in supplying the practical knowledge and skill so necessary to making a livelihood in the woodworking trades.

Descriptive bulletin and prices sent on request.

J. D. Wallace & Co.,
1415 W. Jackson Blvd.,
Chicago, Ill.

Why take chances with flying hatchet heads? V & B Supersteel Hatchets are equipped with Vaughan's Expansion Wedge—the head is firmly ***locked*** tight. Ask your hardware dealer to show you.

VAUGHAN & BUSHNELL MANUFACTURING COMPANY
Makers of Fine Tools
2114 Carroll Ave. Chicago, Ill. U.S.A.

JOHNSON Combination Bench Furnace

Quick Acting Time and Gas Saver Requires No Forced Air Blast

No. 118

A Combination Bench Furnace for soldering, heat-treating or metal melting.
Firebox 6¼ x 5 x 6½ inches.
Fitted with three Powerful Johnson Atmospheric Burners, with shut-off valves and pilot lights.
This furnace has proven the most efficient general purpose Bench Furnace.

Send today for our illustrated booklet of Gas Appliances; shows temperatures, colors, etc.

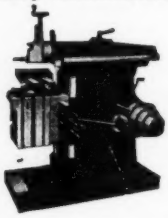
JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative
C. B. Babcock Co., 768 Mission St., San Francisco, Calif.

SHAPERS MILLERS ENGINE LATHES

14"x6'—$400.00
16"x6'— 450.00
With Quick Change Gear Box $85.00 extra

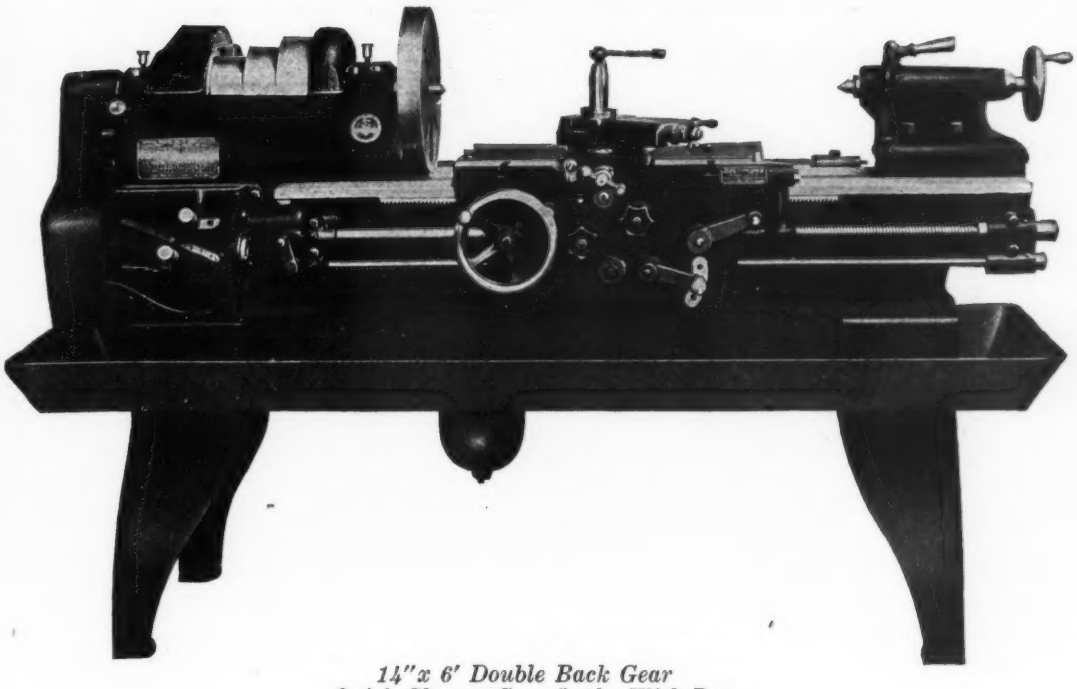
Moderate price machine tools — practically fool proof — ideally suited for school shops. Thousands in use all over the world giving daily satisfaction.



Descriptive catalogue and full particulars furnished upon request.

Industrial Education Department

THE JOHN STEPTOE CO.
CINCINNATI :: :: OHIO



14"x 6' Double Back Gear
Quick Change Gear Lathe With Pan

More Monarch Lathes are being used in manufacturing plants throughout the country than any other make. More Monarch Lathes are being installed in Manual Training Departments of schools than any other make of lathe. The student, upon completion of his school work, will find himself coming in contact with Monarch Lathes in most shops.

Monarch Lathes are built in sizes ranging from 9 inch to 30 inch swing, and bed lengths from 2½′ to 30′.

Our Engineering Department will gladly submit plans and layouts for machine shop installations and we are in position to give Vocational Instructors valuable information and plans, for which no charge is made.

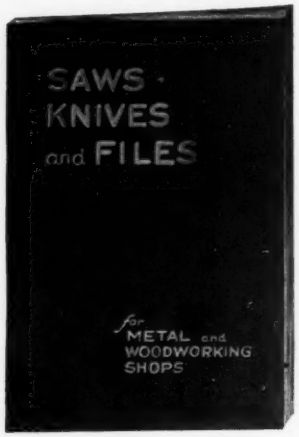
There is a Monarch Dealer near you, who will gladly show you the merits of Monarch Lathes.

Let us send you Special Vocational Bulletin.

THE MONARCH MACHINE TOOL CO.

304 OAK STREET SIDNEY, OHIO

Largest builders of high grade engine lathes and specialist in lathes for Vocational Training.



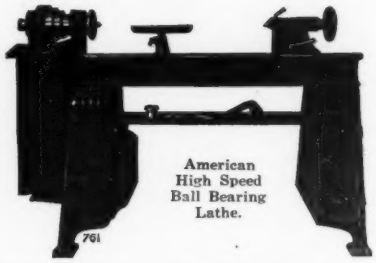
Valuable Book Free To School Instructors

Our new book, containing valuable information of interest to manual training and vocational school instructors, is ready for distribution.

Ask for your copy now. Send us your name and address.

Simonds Saw and Steel Co.
FITCHBURG, MASS.

"don't get hurt"

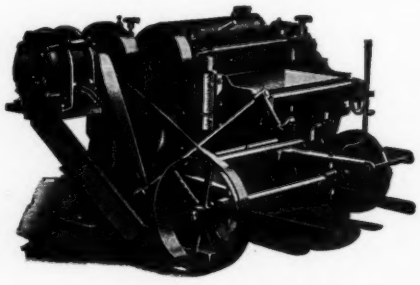


Don't just say it—**make** it next to impossible for a student to get hurt in your manual training classes. **Making** the high-speed lathe **safe** for unskilled manual training students was our first thought in designing the AMERICAN HIGH SPEED BALL BEARING LATHE. The motor, drive pulleys and belt are inclosed. All hand shifting is eliminated by a **sure** one handle belt control and shifting device. Quick-acting emergency brake on head stock. SAFETY is really "first" and simplicity of operation combined with ruggedness under exacting strains a close "second" in the design of this splendid machine. It is your duty to know more about it. Write us today for **complete** specifications.

The same service standards are found in AMERICAN saw benches, jointers, planers, band saws and woodworkers.

American Saw Mill Machinery Company
74 Main St. **Hackettstown, N. J.**

AMERICAN
MANUAL TRAINING EQUIPMENT



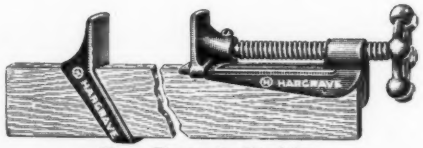
CRESCENT WOOD WORKING MACHINERY in your wood working department will give the same satisfactory service that the machines are delivering in thousands of factories throughout the world.

Send today for catalog of band saws, saw tables, jointers, borers, disk grinders, planers, planers and matchers, swing saws, cut off tables, shapers, mortisers, variety wood workers, universal wood workers.

The Crescent Machine Co.
25 Main Street
Leetonia, Ohio, U. S. A.

Standard Carriage Clamp

Perfection Steel Bar Clamp



Clamp Fixture for Wood Bar

We manufacture a complete and up-to-date line of Clamps, ranging in size from 1 in. to 10 ft. opening, also many other improved mechanics' tools which should interest you. Write for our new catalog.

Ask your dealer for HARGRAVE QUALITY TOOLS

THE CINCINNATI TOOL CO.

Established 1879 **Waverley Ave. and C. L. & N. Ry.**
Incorporated 1884 **CINCINNATI, OHIO**

Work with the Hands Builds Character

HAVE YOU ENTERED OUR $10,000 CONTEST?

Tremendous Response Follows Initial Announcement

All Teachers of Cabinet Making and Directors of Vocational Education are Eligible

The large number of replies to the announcement of our $10,000 Idea Contest proves emphatically that teachers all over the country agree with us that cabinet making possesses untold possibilities for character building and also for both mental and cultural development.

If you are a teacher of cabinet making or a director of vocational education you must agree with this thought too. Then why not write us your ideas on the subject? If you win one of the first prizes you will be handsomely rewarded. If you do not win one of the cash prizes you will receive another award that will make your work well worth while.

HOW TO ENTER THE CONTEST

Write us 500 words or more, telling what you are doing or propose to do to emphasize the cultural side of cabinet making in the training of your boys. We do not care about the technical or trade side except as it may relate to the educational phase of the subject.

All essays submitted will be graded by a board of judges consisting of three men high in the vocational field. The best essays will be bound in book form and distributed broadly throughout the country. You will receive a copy of this book. Perhaps your name and essay will be in it if you try.

Other essays of 500 words and more will receive a merchandise prize,—a useful article which alone you will consider well worth the effort regardless of your chance of winning a major prize.

You will enjoy writing your ideas on the subject. They are valuable to you. They will be valuable to others. They will be valuable to us.

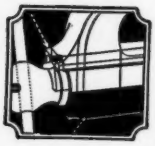
WRITE FOR COMPLETE DETAILS

AMERICAN WOODWORKING MACHINERY CO.

ROCHESTER, NEW YORK

"Steel Ribbed" Slides

Note the flat strip just above the screw. A bar of tough steel, is cast into the slide, providing overstrength where the greatest strain comes.



— and Solid Underportions

Parker Vises are further strengthened by having the Underportion cast solid. Saddle and Saddle Screw are on the outside, permitting the taking up of lost motion and the easy removal of the screw for lubrication.

The Charles Parker Co.
Master Vise Makers
Meriden, Conn., U. S. A.

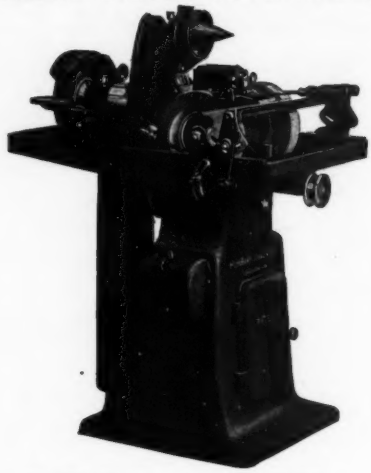
PARKER VISES

Grip Like a Grizzly

MUMMERT-DIXON OILSTONE GRINDERS

The Modern Edge Tool Sharpening Machines

THE STANDARD FOR ALL INDUSTRIAL SCHOOLS



No. 481—Motor or Countershaft Drive.

An automatic attachment for grinding long knives can be furnished with this machine.

THE FIVE LEADING FEATURES

1. Coarse Oilstone Wheel
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5. Emery Wheel

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Hanover, Pa.

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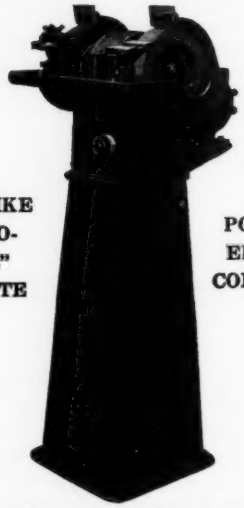

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POWERFUL EFFICIENT CONVENIENT

A modern slow speed oilstone grinder—ideal for school shops. Independent rests and gauges make for correct grinding angles.

Any ten year old boy can grind tools correctly on this machine.

At our prices you cannot afford to be without this machine.

EFFICIENCY GRINDER COMPANY
326 WEST WASHINGTON AVE.
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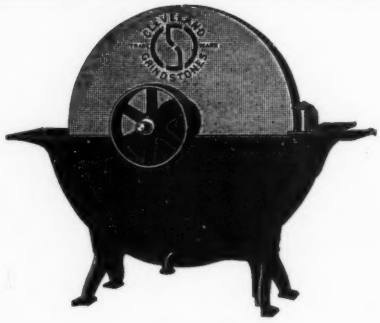

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Back of "Cleveland" Grindstones and Sterling Wheels is a grinding knowledge and grinding experience that extends back seventy-seven years.

Seventy-seven years of knowing how—seventy-seven years of trustworthiness and dependability — certainly ample assurance to you that our products will justify the confidence you place in them. Write for our booklet "77 Years of Grinding," Sent free.

THE CLEVELAND STONE COMPANY,
1836 Euclid Ave. Cleveland, Ohio

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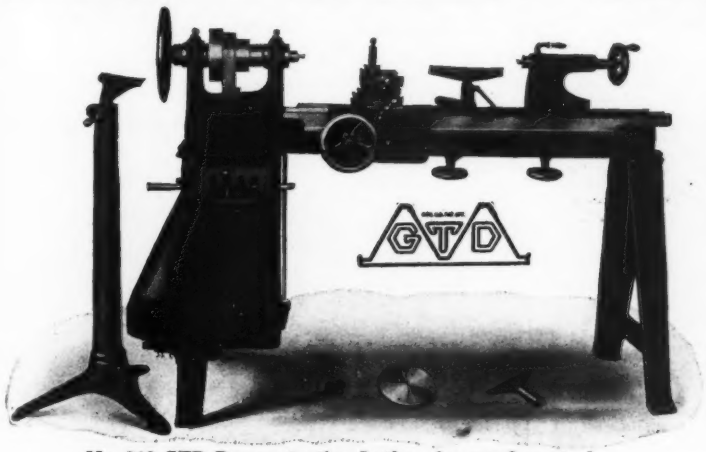

No. 218 GTD Demonstration Lathe—for wood or steel.

When you buy anything—big or little—you like to select the thing best suited to your own requirements, and not be limited in your choice to one or two possibilities.

And so in buying and specifying lathes—be sure that you have our Lathe Booklet, showing plain Speed Lathes, Manual Training Lathes, with overhead, individual motor or underneath shaft drive. Demonstration Lathe for teachers, Bench Lathe, etc.

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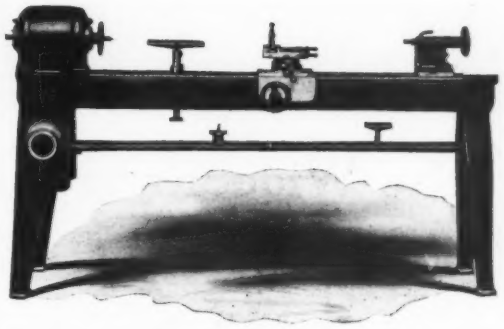

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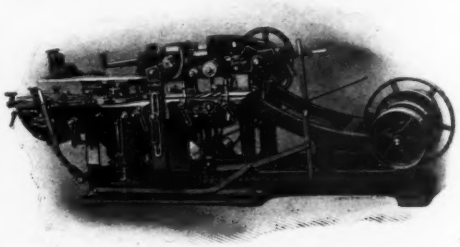

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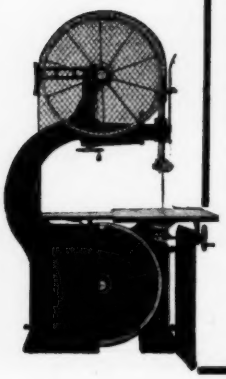

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It handles 37" cutting point to frame and 18" can be taken under the guide.

The Tannewitz Type "G" is very light running. Aluminum wheels with steel spokes and ball bearings if desired. Heavily ribbed table tilts to 45 degrees right and 5 degrees left on machined dovetailed hinges, adjustable for wear. The frame is an extra large and durable one-piece casting, giving extreme rigidity and long life. The Type "G" Band Saw is most thoroughly protected.

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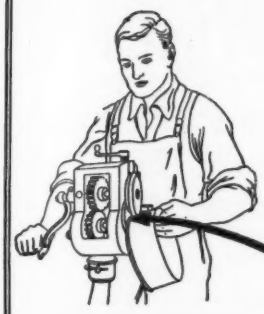

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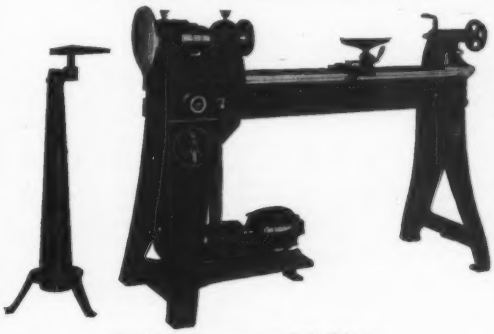
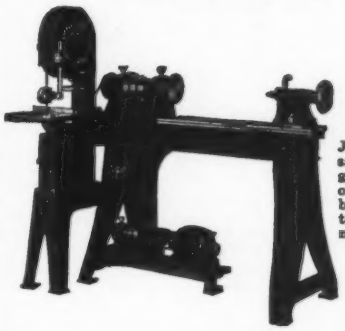
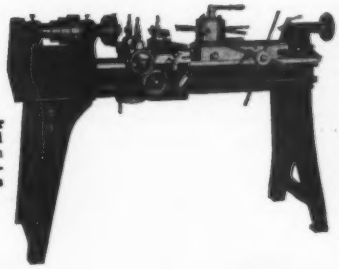


Wood Lathe—motor or belt driven.



Combination Wood Lathe and Band Saw.

Jointer, planer, jigsaw, sander, buffer, grinder, mortiser and other equipment can be furnished and attached in a similar manner.



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All Little Giant Wood and Metal Working Equipment is sold on 30 days' trial, and guaranteed FOREVER against defective material and workmanship.

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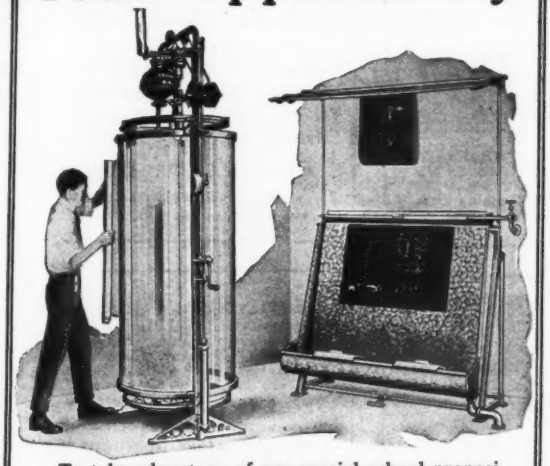

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Cutters—Tool Holders
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Dividers
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Drawing Supplies
Drawing Instruments
Drawing Paper
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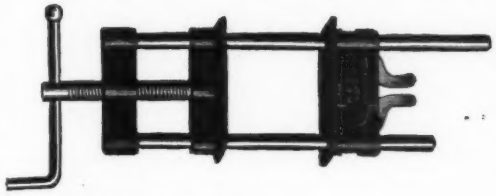

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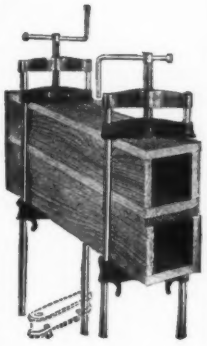

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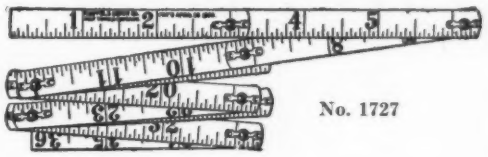

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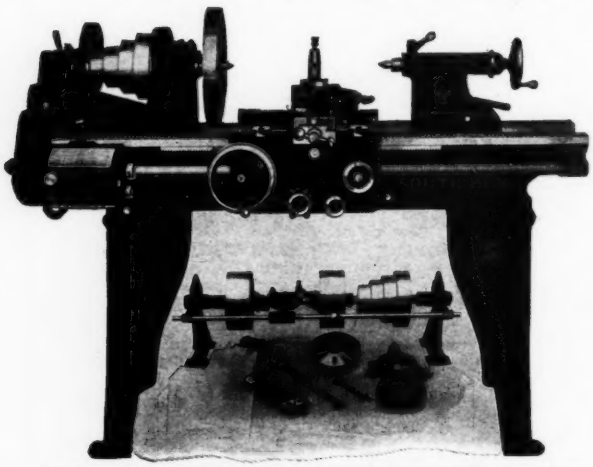

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INDUSTRIAL-ARTS MAGAZINE

Volume XII JUNE, 1923 No. 6

A Brief Investigation of Vocational Trends Among High School Students in Wisconsin

H. W. Schmidt, High School Supervisor, Department Public Instruction, Madison, Wisconsin.

OF late there have been made a number of studies of the trends which high school students exhibit in the direction of vocations and their life's work; also one by Proctor[1] on certain related aspects of these trends. However, the scope of these investigations has not shown to any extent whether these trends persist, whether the choice of a vocation is influenced by school environment, community trends or within the family, or whether so-called "special courses" serve a definite end in this direction.

It was with such questions in mind that the writer undertook to secure some rather extensive data. (A preliminary report was published some time ago[2] but had to be revised on the basis of later study and analysis. The word "preliminary" was omitted in this report. It is not to be understood that this brief paper will answer definitely all the points made above—the scope is possibly not extensive enough and takes into consideration only reports from schools in Wisconsin. At the same time the sampling has been fair and the total number of cases, 8,120 in 48 schools, (excluding Milwaukee with 6,641 cases, which has been made a separate study), should be sufficient to warrant at least certain conclusions which are worth while; certainly they are exceedingly interesting and in part answer a number of mooted questions.

In securing this data, a few types of preliminary test questions were used, but discarded in most part as the student's consciousness of the purpose of the questions seemed to interfere at times with getting a natural response; in other words, the student was not free in answering the main question—he was on his guard. The information was finally obtained by the writer, his colleagues and school principals, in the following manner:

Uniform blank slips were passed out to the students and a series of statements made and questions asked, as below:

(The person in charge read the following statement:)

"You will please place upon your slip the information called for and answer the following questions:

1. "Put down a capital B or G, depending upon whether a boy or a girl is filling out the slip.

2. "In what grade are you now enrolled? Put down Roman numerals in whole numbers; do not put down XB or XLA.

3. "Put down your age to the nearest birthday in whole numbers; do not put down 16 years 5 months, but 16 years, nor 14 years 8 months, but 15 years.

4. "Write down what you propose to do or what vocation you intend to follow or how you expect to earn your living after you have completed your education. Do not put down, 'Expect to go to college.' What is desired is what you intend to do for a living or what you have in mind as your future occupation. If you have nothing definite in mind at this time, do not fill in the blank space.

5. "Answer the following question with yes or no: Is there anyone in your immediate family who is doing the same thing or work that you have put down as your choice? If you have put down no choice, leave the question unanswered, of course.

(In a number of cases the writer called for some additional information which will be mentioned later.)

The above directions were duplicated and sent out to some of the schools. After the slips were returned for tabulation, a number of instances were discovered in which everyone had put down some occupation and no one seemed undecided. Investigation showed that in some of these cases instructions were not followed and the students told to "put down something" for question 4. Schools 2, 43, and 46 were, however, shown to be bonafide reports; the small number of students in these schools may account for the fact that all replied to the question. It was not possible to use all the slips returned, due to errors, misunderstandings, facetious replies, wilful neglect, incomplete data, etc. Only those replies were used which were complete. The totals used are found in Table II.

The schools sending data were selected as to location, size and character of population, and likely represent a very good sampling of the state at large. The foreign elements are well represented and the geographical distribution is good. The results, therefore, should

[1] The Use of Psychological Tests in the Vocational Guidance of High School Pupils. J. of Ed. Research, Sept. 1920.
[2] Ind. Ed. Circular No. 11, 1922, Bureau of Education, Washington, D. C.

Table I.—Key Table Showing Various Data of Schools Included in This Study and the Special Courses Offered in Each School.

School	City Population	H. S. Enrollment	Special Courses			
1	19,561	675	M.A.*	H.E.*	Comm.	
2	701	75				
3	1,623	165	M.A.	Ag.		
4	690	68	Ag.			
5	9,130	385	M.A.*	H.E.*	Comm.	Ag. Tchr. Tr.
6	3,060	192	M.A.	H.E.	Comm.	
7	2,688	260	M.A.	H.E.	Comm.	
8	652	45				
9	758	79	H.E.	Comm.		
10	779	104	M.A.	H.E.		
11	4,515	206	M.A.	H.E.	Comm.	
12	950	83	H.E.	Comm.	Ag.	
13	3,014	243	M.A.	H.E.	Comm.	
14	2,572	143	M.A.	H.E.	Comm.	Tchr. Tr.
15	1,865	125	H.E.	Comm.		
16	3,581	212	M.A.	H.E.	Comm.	(Co. Tr. Sch.)
17	788	68	H.E.	Ag.		
18	1,754	149	Comm.			
19	2,017	37	Comm.			
20	13,610	529	M.A.*	H.E.*	Comm.	(Co. Tr. Sch.)
21	1,966	209	H.E.	Comm.	Ag.	
22	3,011	137	H.E.	Comm.	Tchr. Tr.	
23	5,104	351	M.A.*	H.E.*	Comm.	
24	2,569	172	M.A.	H.E.	Comm.	
25	944	142	M.A.	H.E.	Comm.	(Co. Tr. Sch.)
26	2,150	104	Comm.			
27	1,914	165	H.E.	Comm.	Ag.	Tchr. Tr.
28	469	60	M.A.	H.E.		
29	800	48	M.A.	H.E.		
30	4,353	224	M.A.	H.E.	Comm.	(Normal Sch.)
31	5,582	303	M.A.	H.E.	Comm.	Ag.
32	4,457	249	M.A.	H.E.	Comm.	(Co. Tr. Sch.)
33	3,020	189	M.A.	H.E.	Comm.	College
34	1,280	80	Ag.			
35	30,955	715	M.A.	H.E.	Comm.	Ag.
36	501	68	Ag.			
37	673	50				
38	1,675	249	M.A.	H.E.	Comm.	Ag.
39	11,371	395	M.A.	H.E.	Comm.	
40	796	88	M.A.	H.E.		
41	3,419	319	M.A.	H.E.	Comm.	Tchr. Tr.
42	729	108	M.A.			
43	858	72	H.E.	Ag.		
44	2,574	304	M.A.	H.E.	Comm.	Ag.
45	9,299	341	M.A.*	H.E.*	Comm.	
46	476	39	H.E.	Ag.		
47	3,378	207	M.A.	H.E.		
48	768	83	M.A.	H.E.		

*Offered for more than two years.

be considered typical for Wisconsin. It is to be noted that Milwaukee, the only city over 75,000 population, is not represented in the general tabulations, except as mentioned.

For obvious reasons the names of the schools are not given but designated by number. Table I gives the cities and towns included in this study by numbers. This table also shows the "special courses" offered in the various schools. In explanation it may be stated that these courses are optional with each high school in the state. The manual arts and home economics courses are offered in the ninth and tenth grades only except where starred, in which case they are offered in the eleventh and sometimes in the twelfth grades as well. Commercial and agricultural courses are offered as four-year courses. High school training courses for teachers of rural schools are differentiated courses for the eleventh and twelfth grades.

Table II is a general tabulation of the data obtained from the 48 high schools, with 8120 replies; the enrollment is given in Table I. The schools were classed as "Industrial," "Semi-Industrial," and "Rural," depending upon the general character of the community; border-line cases were adjusted through concensus of opinion of others.

Two other tabulations were made, one of each school in great detail and another giving collective and collated materials. Both tables are, however, too voluminous to be published in a brief article, though certain conclusions were reached based on this data not published here. The Milwaukee data was found to be such as to influence very materially the conclusions based upon the balance of state data. The influence of a large city upon occupational choice is evident from the tables and it was felt that it would vitiate the general results if it were included, except as mentioned.

The classification of occupations in Table II was made somewhat arbitrarily but in general lends itself to comparison with census and other figures.

"Agriculture" includes possibly 95 per cent of "farmer;" the rest is made up of "horticulturist," "forester," etc.

TABLE II.—VOCATIONAL TRENDS AMONG HIGH SCHOOL STUDENTS OF WISCONSIN.

Class	School No.	Replies Used	TRENDS GROUPED. Agriculture, etc.	Professional	Business	Industrial	Nurse, Dietitian, etc.	Fine Arts	Miscellaneous	Undecided	TRENDS IN DETAIL. Teacher	Engineer	Physician	Lawyer	Architect, Draftsman	Journalist, Librarian	Minister, Missionary	Bookkeeper	Stenographer	Business	Salesman	Mechanic	Electrical Worker	R. R. Worker	Nurse, Dietitian	Dressmaker, Milliner
	1	640	1.5	29.9	24.6	3.7	7.6	4.3	5.2	22.0	13.5	10.6	1.4	1.2	2.9	2.5	0.3	5.2	10.7	7.5	1.2	2.8	0.9	0.9	4.8	0.0
	5	333	3.6	32.1	23.1	8.4	3.6	3.0	5.1	21.0	21.0	7.2	1.2	1.8	1.8	1.2	0.0	3.3	17.4	2.4	0.0	3.6	3.0	0.1	2.1	0.3
	11	191	9.9	31.9	26.6	6.2	6.7	5.7	5.7	6.8	18.4	5.2	2.6	2.6	3.0	1.0	0.0	5.2	15.2	6.2	0.0	6.2	0.0	0.0	5.7	1.0
	19	31	0.0	16.0	74.1	3.2	0.0	0.0	3.2	3.2	6.4	6.4	3.2	0.0	0.0	0.0	0.0	19.3	35.5	0.0	0.0	3.2	0.0	0.0	0.0	0.0
	20	447	0.6	34.3	27.7	4.6	10.0	4.2	4.7	13.4	13.3	14.3	4.2	1.3	0.0	0.0	0.4	5.0	17.9	4.7	0.0	4.6	0.0	0.3	8.9	1.1
Indt'l	24	166	7.2	26.5	10.8	2.4	4.2	3.6	6.1	39.2	9.6	12.7	2.4	1.2	0.0	0.0	0.6	0.0	8.4	2.4	0.0	2.4	0.0	0.0	4.2	0.0
	26	89	1.1	35.9	21.3	6.7	11.3	6.6	5.6	11.3	24.8	4.5	3.2	3.3	0.8	0.0	0.0	3.3	11.3	5.5	1.2	6.7	0.0	0.0	11.3	0.0
	35	508	2.9	32.4	29.4	1.7	4.7	1.7	4.9	21.7	19.0	7.4	1.7	1.1	2.9	0.0	0.3	5.3	16.4	7.7	0.0	1.7	0.0	0.0	4.7	0.0
	Total	2405																								
	Avg.	301	3.2	33.9	27.3	4.4	6.3	3.2		16.8	16.8	10.4	2.5	1.4	2.1	0.6	0.3	5.0	15.6	6.4	0.3	3.5	0.6	0.1	6.0	0.3
	7	246	5.7	30.8	18.7	8.9	0.7	1.5	5.6	27.2	18.7	7.4	0.4	1.5	3.1	0.0	0.7	4.1	9.8	4.1	0.7	3.2	5.7	0.1	0.0	0.7
	15	129	5.4	38.6	28.6	9.2	0.7	3.1	3.8	10.0	31.0	4.6	2.3	0.7	0.0	0.0	0.0	8.5	9.3	10.0	0.0	5.4	3.8	0.0	0.7	0.0
	16	192	2.6	35.8	17.1	3.1	7.2	3.6	6.2	20.9	24.5	5.2	2.0	3.1	0.0	2.0	1.0	3.6	12.0	2.0	0.0	3.1	0.0	0.0	5.2	1.5
	22	108	8.3	26.9	21.2	7.4	0.0	1.8	7.4	26.9	11.2	13.9	0.9	0.9	0.0	0.0	0.0	7.4	8.3	5.5	0.0	3.7	3.7	0.2	0.0	0.0
	23	333	3.0	28.6	23.7	6.9	5.4	3.9	4.5	24.1	19.0	6.3	1.5	1.2	1.5	0.9	0.3	2.1	18.6	3.0	0.0	4.5	1.2	0.0	3.6	0.9
	30	202	8.9	42.4	14.7	3.4	3.8	1.9	1.9	22.3	34.2	5.9	0.9	0.5	0.9	0.0	0.0	0.9	10.4	2.5	0.9	2.5	0.9	0.0	2.9	0.9
Semi-	31	254	4.3	33.0	26.6	1.8	2.3	3.5	3.9	24.5	18.9	8.6	3.5	1.6	0.0	0.0	0.4	1.9	20.6	3.1	0.8	0.8	0.8	0.1	1.9	0.4
Indt'l	32	208	2.4	22.0	24.0	4.8	7.5	3.5	4.3	29.3	15.4	2.4	1.4	1.4	0.0	1.4	1.4	4.3	17.4	1.9	0.4	4.8	0.0	0.0	5.2	1.1
	38	208	8.1	33.9	17.3	3.8	4.8	0.9	3.4	27.4	29.2	0.9	2.9	0.9	0.0	0.0	0.0	2.4	12.5	2.4	0.0	3.0	0.8	0.0	4.8	2.0
	39	355	0.8	36.4	38.5	5.6	3.7	2.8	4.8	6.4	17.1	10.4	4.2	3.1	0.8	0.0	0.8	7.6	21.9	9.0	0.0	5.6	0.0	0.0	2.4	1.3
	41	231	9.9	46.3	19.5	2.1	3.0	3.0	6.9	9.1	36.4	6.0	1.3	1.3	0.0	0.0	1.3	3.0	11.3	4.4	0.8	1.7	0.4	0.0	2.6	0.4
	45	296	4.0	35.0	35.2	6.0	4.4	3.0	6.6	4.0	19.9	6.0	2.4	2.7	3.3	1.7	0.0	6.1	20.2	7.5	1.4	5.0	2.0	0.0	2.7	0.0
	Total	2753																								
	Avg.	230	4.7	34.7	26.0	4.6	4.0	3.1	4.7	18.1	22.5	6.6	2.3	1.7	0.8	0.3	0.5	4.2	15.8	5.8	0.2	3.8	0.7	0.1	3.3	0.7
	2	62	9.6	38.7	27.3	4.8	9.6	4.8	4.8	0.0	27.5	4.8	1.6	4.8	0.0	0.0	0.0	11.3	6.4	8.0	1.6	4.8	0.0	0.0	3.3	0.7
	3	162	4.3	22.1	9.8	1.8	7.4	1.8	6.1	44.4	11.1	8.6	1.2	1.2	1.8	0.0	0.0	2.4	4.9	2.5	0.0	1.8	0.0	0.0	9.6	0.0
	4	62	11.3	59.6	14.4	0.0	3.2	3.2	0.0	8.0	50.0	4.8	1.6	3.2	0.0	0.0	0.0	1.6	4.8	8.0	0.0	0.0	0.0	0.0	7.4	0.0
	6	177	5.0	22.6	18.9	5.0	2.2	5.6	5.0	35.6	12.5	5.6	2.2	1.7	0.0	1.0	0.6	1.1	12.5	4.5	0.6	5.0	0.0	0.0	3.2	0.0
	8	34	5.8	20.5	20.4	8.8	11.7	8.8	17.7	5.8	14.7	5.8	0.0	0.0	0.0	2.9	0.0	5.8	2.9	11.7	0.0	8.8	0.0	0.0	2.2	0.0
	9	59	1.7	40.1	13.5	0.0	5.1	1.7	6.7	32.3	23.8	10.2	1.7	3.4	0.0	0.0	0.0	5.1	6.7	1.7	0.0	0.0	0.0	0.0	8.8	0.0
	10	93	1.0	41.7	8.5	2.1	2.1	3.2	1.0	40.0	33.3	6.4	0.0	1.0	0.0	0.0	1.0	1.0	4.3	3.2	0.0	2.1	0.0	0.1	3.4	1.7
	12	72	9.7	34.5	20.7	6.7	2.7	0.0	4.1	23.7	23.7	4.1	1.3	1.3	0.0	0.0	1.3	2.7	8.3	9.7	0.0	5.4	1.3	0.0	2.1	0.0
	13	206	1.4	30.4	28.0	6.4	6.7	5.8	7.7	13.1	12.6	7.7	3.4	2.9	1.4	1.9	0.5	2.4	4.3	3.4	1.9	6.4	0.0	0.0		0.0
	14	134	8.9	32.8	26.1	5.9	5.2	1.5	10.5	8.9	26.2	5.2	0.7	0.7	0.0	0.0	0.0	2.2	16.5	7.4	0.0	5.9	0.0	0.0	4.9	0.9
	17	69	16.0	45.3	9.2	5.7	7.5	7.3	7.3	2.9	41.0	2.9	0.0	1.4	0.0	0.0	0.0	1.7	1.7	5.8	0.0	4.3	1.4	0.0	5.2	0.0
	18	132	8.8	37.9	24.9	6.8	6.0	1.5	8.8	4.4	28.8	6.0	0.8	0.8	1.5	0.0	0.0	2.2	15.9	6.8	0.0	6.8	0.0	0.0	7.5	0.0
	21	187	4.8	29.6	22.0	1.5	4.8	1.5	2.6	32.1	20.0	5.4	3.2	0.5	0.0	0.0	0.5	1.1	15.5	5.4	0.0	1.5	0.0	0.0	6.0	0.0
	25	140	7.1	42.8	19.2	1.4	7.1	3.5	5.9	10.7	34.3	7.8	0.0	0.7	0.7	0.0	0.0	2.8	14.3	0.7	1.4	2.1	0.7	0.0	3.7	1.1
	27	135	5.9	48.1	21.4	2.2	7.4	0.7	2.2	11.8	38.6	6.6	2.2	0.7	0.0	0.0	0.0	2.2	13.3	5.9	0.0	2.2	0.0	0.0	7.1	0.0
Rural	28	55	12.8	52.7	12.7	3.6	3.6	1.8	1.8	11.0	41.9	5.4	5.2	0.0	0.0	0.0	0.0	1.8	9.1	1.8	0.0	3.6	0.0	0.0	7.4	0.0
	29	45	11.1	28.8	24.6	2.2	13.2	2.2	7.2	15.5	15.5	11.1	2.2	0.0	0.0	2.2	0.0	4.1	11.1	8.8	0.0	2.2	0.0	0.0	1.8	1.8
	33	183	6.0	38.1	17.4	3.2	5.4	8.7	8.2	13.7	25.5	6.6	1.6	2.2	2.2	0.0	0.0	1.6	9.7	3.2	1.6	3.2	0.0	0.0	6.6	4.4
	34	78	10.3	33.1	29.5	5.1	5.1	2.5	6.4	7.7	21.8	2.5	3.8	3.8	0.0	0.0	1.2	6.4	16.7	5.1	1.3	5.1	0.0	0.1	5.4	0.0
	36	66	12.2	50.0	7.5	3.0	7.5	3.0	4.5	12.2	38.0	4.5	4.5	1.5	0.0	0.0	0.0	0.0	1.5	6.0	0.0	3.0	0.0	0.0	5.1	0.0
	37	44	9.1	56.7	15.8	0.0	4.4	0.0	9.1	4.5	29.5	15.9	4.3	0.0	0.0	2.2	1.5	4.5	4.5	6.8	0.0	0.0	0.0	0.0	4.5	3.0
	40	80	7.5	41.2	13.7	5.0	2.5	2.5	7.5	20.0	25.0	8.7	5.0	2.5	0.0	0.0	0.0	7.5	2.5	3.7	0.0	5.0	0.0	0.1	2.2	0.0
	42	93	6.4	38.7	21.5	1.0	3.2	6.4	3.2	19.4	31.2	4.3	0.0	0.0	0.0	0.0	0.0	0.0	19.4	2.1	0.0	1.0	0.0	0.0	2.5	0.0
	43	59	11.8	42.5	18.6	1.7	15.2	1.7	8.5	0.0	28.7	5.1	3.4	5.1	3.2	8.5	0.0	3.4	3.4	11.8	0.0	1.7	0.0	0.0	3.2	0.0
	44	230	4.0	43.4	13.3	3.5	7.8	3.0	4.0	20.2	27.0	6.9	3.5	3.0	0.0	0.0	1.7	1.7	7.8	2.6	0.4	3.1	0.4	0.0	6.7	0.0
	46	30	10.0	39.9	19.8	6.6	10.0	6.3	6.6	0.0	26.6	10.0	0.0	3.3	1.3	0.0	0.0	6.6	6.6	6.6	0.0	6.6	0.0	0.0	7.8	0.0
	47	195	7.1	39.5	31.3	4.1	2.0	4.6	1.0	10.3	21.6	11.4	2.0	2.5	0.0	0.0	0.5	7.7	19.5	4.1	0.0	4.1	0.0	0.0	10.0	0.0
	48	80	6.2	34.9	21.2	2.5	1.2	2.5	2.5	28.8	36.3	1.2	1.2	0.0	1.5	0.0	1.2	1.2	13.8	2.5	3.7	2.5	2.5	0.0	2.0	0.0
	Total	2962																								
	Avg.	106	6.7	37.5	19.4	3.7	5.2	3.5	4.8	19.0	25.0	7.0	2.1	1.8	0.8	0.4	0.4	2.8	11.2	5.0	0.4	3.5	0.1	0.1	4.8	0.4
	Gd. To.	8120																								
	To. Av.		5.5	35.0	23.5	4.2	5.1	3.4	4.7	18.1	21.5	7.6	2.2	1.7	1.2	0.4	0.4	3.9	13.9	5.4	0.3	3.6	0.5	0.1	4.6	0.5

"Professional" includes teacher, engineer, lawyer, doctor, dentist, architect, chemist, minister, journalist, etc.

"Business" includes banking, business, merchant, salesman, secretary, stenographer, bookkeeper, clerk, etc.

"Industrial" is formed of mechanics, carpenters, machinists, electrical workers, and trades in general.

"Fine arts" refers to musician, painter, artist, actor, etc.

"Nurse, etc." includes nurse, dressmaker, milliner, cook, dietitian, etc. It will be designated at times as Women's Work."

"Miscellaneous" includes aviator, soldier, sailor, radio operator, baker, butcher, professional ball player, beauty parlor operator, policeman, chiropodist, lady's maid, etc.

A partial detailed tabulation is contained in Table IV, and this will show certain distributions which are subject to greater analysis later. The other tables are self-explanatory.

Tables III and IV show the generalized results of the data contained in Table II. They are to be interpreted as representing per cents of those reporting in

TABLE III.—GENERAL RESULTS IN PER CENT.

	Boys	Girls	Total	Milwaukee	Census Wis.	Census U. S.
Agriculture	11.5	0.4	5.5	0.4	30.9	26.3
Professions	33.8	35.6	35.0	33.2	5.2	5.2
Business	10.9	32.3	23.5	28.5	15.2	17.7
Industrial, etc.	9.8	0.0	4.1	2.3	34.1	30.8
Transportation	0.4	0.0	0.2	0.1	6.1	7.4
Nurse, etc.	0.0	9.3	5.5	2.7	....	....
Fine Arts	1.3	4.9	3.4	3.6	....	...
Miscellaneous	8.6	2.1	4.7	2.0	....	....
Undecided	23.4	14.5	18.1	26.7	....	....

each class. For instance, under "Fine Arts," *of all boys* reporting, 1.3 per cent gave as their choice this subject, while *of all girls reporting,* 4.9 per cent gave the same choice; *of all reporting,* 3.4 per cent chose it also. Where per cents and sex are mentioned hereafter in all tables, reference is had to the same type of tabulation.

In looking over Table III one is struck with certain facts which are significant; the number of undecided is relatively small (18.1) as compared with generally accepted notions that high school students do not know what they want to do for a living. The per cent under "industrial" (4.1) is very small compared, for example, with that under "professional" (35.0) and "business" (23.5), which might be expected. The business career of girls seems rather large. The "white collar" job is quite in evidence. "Business" for boys (10.9) is a fairly representative figure as it is not "contaminated" with the large percentage of stenographers (23.0) for girls which is included under the totals, leaving a percentage of (5.7) for boys and (5.8) for girls as possibly representing what might be termed actually as "business," and "clerical work" being but little. (Table IV).

A real situation confronts us, however, when we compare the column of "census" with that of trends. The census figures were obtained from advance sheets of the U. S. census of 1920, and show the percentages of those occupied in "gainful occupations" in each large group. Both national and Wisconsin figures are given.

TABLE IV.—SUBDIVISIONS OF CLASSES OF TABLE III—RESULTS IN PER CENT OF TOTALS.

Professional.

	Boys	Girls	Total
Teacher	3.4	34.3	21.5
Engineer	18.4	0.0	7.6
Physician, dentist, etc.	4.8	0.4	2.2
Lawyer	3.8	0.2	1.7
Minister, missionary	0.5	0.2	0.4
Architect, draftsman, etc.	2.8	0.0	1.2
Journalist, etc.	0.1	0.5	0.4

Business.

	Boys	Girls	Total
Accountant	3.6	4.2	3.9
Stenographer	0.8	23.0	13.9
Salesman	0.8	0.0	0.3
Banking, business, etc.	5.7	5.8	5.4

Nurse, Etc.

	Boys	Girls	Total
Dietitian, etc.	0.0	0.6	0.4
Nurse	0.0	7.9	4.6
Dressmaker, milliner, etc.	0.0	0.8	0.5

Industrial, Etc.

	Boys	Girls	Total
Mechanic, carpenter, etc.	8.7	0.0	3.6
Electrical worker, etc.	1.1	0.0	0.5

There is, of course, some overlapping and some discrepancies in the classification, but not enough to destroy the significant features of the comparison. Detailed data is not yet available. One is struck with the relations expressed "professional," "agriculture," and "industrial." As far as the first is concerned we must concede that a high school career is indispensable in the professions; one wonders, however, if these trends persist, what the chances are for either employment or success with an apparent over-production such as a ratio of seven to one seems to indicate *at this stage of education.* Are the weeding-out process later and the survival of the fittest such that they will prevent over-production? Is there not an immense amount of waste and lost motion when we consider that but one in seven at this time stands a chance of success? "Agriculture" with a reverse ratio of one to five is about as bad. It is true that on the basis of boys reporting the ratio is somewhat higher. It has often been said that a high school education is not either necessary or much in evidence among farmers and that the employees and farmers are largely recruited from the ranks of those who have only an eighth grade education. The latter argument appears to be an unfortunate one and hardly in keeping with the trends of today; rather is it becoming increasingly true that a high school education is a minimum and that a high type of education and intelligence are needed to make farming a paying business.

The same arguments are often advanced to explain the discrepancy between the needs and trends along vocational lines, in this instance exhibiting a ratio of eight to one, and should be discounted in as great a measure as for agriculture. Transportation with its needs of 6.1 per cent is left virtually without support; even the "religious" class credits itself with 0.4 per cent.

Unfortunately, the 1920 census figures are not yet available in detail, so that more definite comparisons connot be made at this time. At the same time it appears that in this state at least, if not in others, little if any attention is yet paid to educational or vocational guidance. It would be of value if there could be carried on a check study in schools where attention was given to this phase of educational work. It is not likely that such a distribution as above will be in evidence in a school system where vocational guidance is given; we will have to agree that it is necessary and it does not need these figures to prove the contention.

TABLE V.—RANGE OF CHOICE AND DISTRIBUTION.
(Based on Totals.)

	Min.	Max.	Av.	Home Infl.	Ind. Com.	Semi Ind. Com.	Rural Com.
Agriculture	0.0	16.0	5.5	93.6	3.2	4.7	6.7
Professions	15.0	59.6	35.0	22.5	33.8	34.7	37.5
Business	7.5	74.1	23.5	22.2	27.3	26.0	19.4
Nurse, etc.	0.0	15.2	5.5	*	6.3	4.0	5.2
Industrial	0.0	9.2	4.1	*	4.4	4.6	3.7
Fine Arts	0.0	8.8	3.4	*	3.8	3.1	3.5
Undecided	0.0	44.4	18.1	*	16.8	18.1	19.0

*Negligible.

Note: For explanation of column 4, see text page 219.

Table V shows the range and distribution of the subjects chosen, by grade groups and community classes. It does not appear as if community needs were being met to any extent. One might expect a greater divergence in agriculture among the three groups represented than is expressed by the table, 3.2 per cent, 4.7 per cent, 6.7 per cent. The professions seem to more than hold their own in rural communities with a percentage of (37.5) as compared with (33.8) in industrial communities. The compensation of "business," with (27.3 per cent) in industrial communities is to be expected, but even here the rural cases are in the running with (19.0 per cent.) Fine arts surprisingly holds it own, probably due to the fact that it may be considered an "emotional" element not subject, in any degree, to educational influence. "Undecided" is not influenced materially by the greater choice and facilities of the larger community. The boys seem to be more in doubt than the girls, possibly due to the smaller occupational choice open to the girls.

Column 4 of Table V needs some explanation. It is compiled from data obtained from question 5. It was thought that possibly some relation might be established between the frequency of an occupation and the frequency of "home influence." The only positive and definite result seems to be that in connection with "agriculture," where the influence is unquestionable, (93.6 per cent) of those choosing this occupation reporting someone in the family engaged in the same work. This may be expected as farming seems to be somewhat of a "family affair," and comparatively few outsiders are heading in this direction; the more need for influx. Possibly "professions" and "business" may also be regarded as being within the "sphere of influence," with 22.5 per cent and 22.2 per cent charged to them respectively; at that, the chances of influence are not very great. In other occupations and within a detailed analysis of results not tabulated here, there does not seem to be anything warranting a positive assertion.

The original question five was not couched in terms to get a more positive statement of home influence from the student, in order to remove any bias or doubtful attitude. Besides, an answer based upon self-analysis by the student, in such a positive direction, would likely be of little more value than that based upon the original question.

It is interesting to note that the maximum of "profession," 59.6 per cent, is assigned to school, a community, No. 4, which has no outstanding characteristics in this direction—in fact is almost devoid of the professional man or woman except the minister, the doctor, and the school teacher. It may be argued that the dearth of opportunity offered in the school curriculum has influenced the choice; hardly to the extent named. Personal knowledge does not show anything in the school or its administration that would warrant such a percentage. The maximum of "business," 74.1 per cent, is found in a single industry town, where the type of work industrially considered is not overly attractive. But business opportunities are also nearly wholly lacking. The key to this situation lies in the fact that the school has just established a commercial course — therefore the popularity as exhibited in a very large enrollment, unwarranted from nearly every standpoint. Here is food for reflection; it is not necessary to point out the moral.

TABLE VI.—PER CENT DISTRIBUTION OF VOCATIONS IN EACH GRADE GROUP.
(Based on number in each occupational group.)

	Grades 9-10	Grades 11-12
Agriculture	72.4	27.6
Professions	56.3	43.7
Business	59.1	40.9
Industrial	79.0	21.0
Nurse, etc.	62.7	39.3
Fine Arts	49.2	50.8
Undecided	69.3	30.7

Table VI shows the distribution by grades, being grouped as grades 9-10 and 11-12. It is based upon the distribution of each occupational group, taken separately, and considering the *number enrolled in the grade groups.* The distribution of Agriculture is marked—72.4 per cent in the first two grades and 27.6 per cent in the junior and senior years. As stated before, agriculture courses are given for four years, and the results just cited show the falling-off in the later years, due to those dropping the work and turning their attention to other pursuits, which might be expected. For the professions one would expect a reversal of the figures given, 56.3 per cent and 43.7 per cent, though the difference is not very great. Industrial pursuits do not seem to lack in the school life of the student, nor that of nurse, etc., i. e., women's work. However, if it is remembered that manual arts and home economics work are given in the first two years, it may solve this problem partially. Substantiating data is found in the detailed table where the choice of characteristic occupations, which might be influenced by the special courses, is well confined to the early years of the high school. In a number of instances personal investigation showed that where large percentages were encountered this was due in a great measure to the personal influence of a teacher or a fine course or special equipment. The scope of this part of the study does not warrant any but a personal opinion.

TABLE VII.—CORRELATIONS.

a. In seventeen schools having strong commercial courses, 24.1 per cent of students chose "business." Average 23.5 per cent.

b. In sixteen schools having strong home economic courses, 9.9 per cent of girls chose "nurse, etc." Average 9.3 per cent.

c. In seventeen schools having strong manual arts courses, 9.5 per cent of boys chose "mechanic, etc." Average 9.8 per cent.

19.2 per cent of boys chose "engineer." Average 18.4 per cent.

3.7 per cent of boys chose "architect and draftsman." Average 2.8 per cent.

d. In fifteen schools having agriculture courses, 14.1 per cent of boys chose "agriculture, etc." Average 11.5 per cent.

e. In twelve schools having strong vocational courses, 15.0 per cent of girls are "undecided." Average 14.5 per cent.

24.8 per cent of boys are "undecided." Average 23.4 per cent.
19.3 per cent of total are "undecided." Average 18.1 per cent.

f. In five schools having teacher training courses, 26.8 per cent of total chose "teacher." Average 21.5 per cent.

g. In twelve schools having teacher training courses, or situated in "teacher training towns," 38.2 per cent of girls chose "teacher." Average 14.5 per cent.
3.6 per cent of boys chose "teacher." Average 3.4 per cent.
19.9 per cent of total chose "teacher." Average 21.5 per cent.

One of the most characteristic results of this study is found in Table VII. The word "Correlations" was used here in place of a better one. This table is almost self-explanatory. One might well believe that in those schools where special courses were being given, they would influence the trends to the extent that this would at least be definitely shown, taking for granted that these courses satisfy the needs or inclinations in this direction or serve as finding-out courses. But a glance at the table will clear up this matter in no uncertain terms. Sections (d), (f), and (g) indicate something positive, 14.1 per cent of boys choosing agriculture in fifteen schools offering work along this line, as compared with an average of 11.5 per cent, and likewise in five schools offering teacher training courses we find 26.8 per cent of total chose teacher while for the general average we have 21.5 per cent—nothing startling, however. The other courses seem to have little or no influence on vocational trends.

It is not within the scope of this article to analyze the situation so far as to look for ultimate causes or to define or suggest remedies, if such are needed. However, one is naturally confronted with the questions, "In what direction are the special courses functioning? Is it to be expected that they do so in directions which would appear in this study? Do they actually guide students? Do they function as trying-out courses? Do they contain elements within themselves which lead to definite endeavor on the part of the student in occupational directions? Is their purpose for that type of educational endeavor usually designated as 'general?'" Possibly they are valuable in all the above designated directions and have no outstanding function.

TABLE VIII.—RELATION BETWEEN VOCATIONAL TRENDS IN 1920 AND 1921 FOR SIX SCHOOLS.

	For 1920		For 1921	
	Number	Per Ct.	Number	Per Ct.
Teacher	257	16.2	235	18.1
Architect	19	1.2	16	1.2
Engineer	152	9.6	120	9.7
Chemist and Pharm.	0	0.0	3	0.2
Physician	38	2.4	27	2.4
Lawyer	30	1.9	23	1.8
Journalist	2	0.1	7	0.6
Librarian	2	0.1	3	0.2
Missionary, Minister	8	0.5	7	0.6
Business	72	4.6	53	4.1
Accountant	66	4.2	47	3.6
Stenographer	252	16.0	228	17.5
Salesman	3	0.2	5	0.4
Mechanic	73	4.5	39	3.0
Farmer	49	3.1	35	2.7
Nurse, etc.	95	6.0	74	5.7
Dressmaker	14	0.9	8	0.5
Fine Arts	60	3.8	57	4.4
Miscellaneous	74	4.7	40	3.1
Undecided	307	19.4	269	20.7
Total	1573		1296	

The question of "holding over" of occupational choice is an important one and off-hand opinion denies that there is anything in it—that high school students, and for that matter University students as well "do not know what they want to do." To get some indication on this subject, six schools with an enrollment in excess of one hundred each were chosen more or less at random and a year after the first data was secured, similar slips and directions were sent out and students requested to fill in the blanks, paying no attention to anything they might have put down the previous year. The tabulation was made on the following assumption: that the 1920 enrollment in grades 9, 10, and 11 was substantially composed of students enrolled in grades 10, 11, and 12 in 1921. Accordingly, data from the twelfth grade of 1920 and the ninth grade of 1921 was discarded and the results tabulated in Table VIII. Of course, the assumption is not one which will bear exact mathematical treatment, but is near enough correct not to vitiate entirely the results obtained.

The relations between the various trends is surprising, certainly not in any measure anticipated. The number of replies are, of course, not large nor the schools numerous enough to warrant a didactic statement that vocational trends *do carry over and stay with* students for a number of years. It is possible that compensations may account for some of the evidence, i. e., the trends are equalized by different students' choices. A more definite answer might be given if the investigation could be carried on for a number of years with the same people. As it is, however, there is a definite trend manifested which will bear investigation at various hands.

Table IX contains data from six high schools of Milwaukee. A study of the column of percentages will show certain trends which would materially influence the data of Table II, aside from the number involved in one city, 6,641, as compared with 8,120 in 48 schools about the state. The greater range of subjects in Table X as compared with the other tables is evident and of course is to be expected, due to the greater variety of courses offered in the schools, as well as the number of occupations with which students are familiar. The bookkeeper of the smaller town now is an accountant; the druggist is a pharmacist, and the farmer an agriculturist.

In this case the data slips also carried the information whether the student was taking or had taken courses in the special subjects. There appeared to be some relation between the subjects taken and the occupational choice, but whether this is truly due to guidance or incidental does not appear positively.

Virtually all those who have designated "accounting," "stenography," and "office work" as their choice

TABLE IX.—DATA FROM MILWAUKEE SCHOOLS—6,641 CASES.

	I Per Cent	II Per Cent	III Per Cent	IV Per Cent	V Per Cent	VI Per Cent	Total	Boys Per Cent	Girls Per Cent	Totals Per Cent
Teacher	12.5	2.6	8.1	15.5	12.1	6.9	614	0.5	19.0	9.3
Physician	4.1	2.2	1.8	5.0	3.6	2.8	207	5.5	0.4	3.1
Lawyer	5.1	2.1	2.4	2.6	3.2	2.9	210	5.3	0.7	3.1
Architect	3.2	2.7	2.4	5.8	3.8	1.8	205	5.8	0.0	3.1
Engineer	12.5	5.5	6.3	12.0	13.2	10.4	659	18.7	0.0	10.2
Chemist and Pharm.	1.6	1.4	2.5	1.4	3.3	1.3	139	3.6	0.3	2.0
Business	4.2	2.2	2.7	4.9	3.4	4.9	240	5.8	1.1	3.7
Accountant	4.6	4.8	4.3	7.6	8.1	3.3	356	7.0	3.7	5.3
Stenographer	16.1	16.2	19.0	25.9	25.2	11.0	1214	6.1	31.1	18.3
Salesman	1.8	0.0	0.9	0.0	1.2	0.9	61	1.7	0.0	0.9
Office Work	1.5	0.0	0.0	0.0	0.0	0.0	18	9.3	0.2	0.3
Journalist	1.5	0.7	1.9	0.9	1.9	2.0	105	0.7	2.6	1.4
Secretary	1.1	0.0	0.0	0.7	0.0	1.0	29	0.1	0.8	0.4
Librarian	1.0	0.0	0.6	0.0	0.4	0.5	30	0.0	1.0	0.4
Farmer, etc.	0.6	0.4	0.6	1.9	0.7	0.5	48	1.3	0.0	0.7
Nurse and Dietitian	4.1	0.7	2.0	2.3	2.2	1.8	147	0.0	4.7	2.3
Decorator	1.4	0.0	0.0	0.0	0.0	0.0	17	0.0	0.5	0.3
Minister, etc.	0.1	0.0	0.1	0.5	0.3	0.2	14	0.3	0.1	0.2
Dressmaker, etc.	0.2	0.0	0.1	0.3	0.1	0.0	9	0.0	0.3	0.1
Fine Arts	4.1	2.4	3.0	4.4	2.2	5.7	239	2.2	5.2	3.6
Mechanic	1.1	1.1	3.0	5.1	2.9	1.8	156	4.5	0.0	2.3
Transportation	0.2	0.0	0.0	0.0	0.4	0.0	8	0.2	0.0	0.1
Miscellaneous	3.2	1.1	1.8	1.6	1.6	2.8	138	2.0	2.2	2.0
Undecided	13.4	53.5	36.6	1.6	9.5	36.7	1781	28.2	25.5	26.7

Characteristics of School Districts.

School I Residential district.
School II Residential, industrial district.
School III Industrial, commercial district.
School IV Industrial district.
School V Residential, industrial district.
School VI Commercial, residential district.

are taking commercial work in school. Whether this is due to vocational choice or whether the latter is due to the subject matter is, of course, not evident. Commercial courses enroll in large numbers physicians, nurses, violinists, actors, librarians, teachers, druggists, etc. Judging by other schools, there does not seem to be much evidence that choice is influenced much by the subject taken. "Banking," "business," "salesman," etc., are found to be taking commercial work to the extent of 50 per cent; 75 per cent of draftsmen and architects are enrolled in manual arts courses, and 45 per cent of mechanics and 25 per cent of engineers are also enrolled in these courses. However, only four per cent of the "nurses," etc., are found taking home economics work. About 60 per cent of those taking vocational courses are "undecided." Home influence is not in evidence to any extent except in "business," where about 50 per cent indicates it.

Tables XI, XII, and XIII give characteristic details of the three types of communities mentioned before, and are self-explanatory. The ratios at the bottom of each table are approximate and may be used by the reader in a rough way to follow through the frequency of the various occupations in each grade.

Conclusions.

The various conclusions arrived at in this study so far may be briefly summarized as follows:

1. The occupations chosen by high school students are not influenced to any extent by the character of the community in which these students are going to school, with the possible exception of farming.

2. With the exception of farming there is no evidence that "home influence" is an important factor in the choice of an occupation.

3. The relation existing between the number choosing an occupation and the number required by the state or the nation's needs is nil. There is either a very large over-production or a very decided under-production. Even if it is granted that certain occupations are recruited largely from those not possessing a high school education, the discrepancy is greater than can be explained on this basis and on the basis of modern trends which look toward a secondary school education as a minimum.

4. Eighty per cent of high school students choose an occupation, contrary to accepted notions that they do not know what they want to do.

5. The vocational trends appear to persist in a marked degree and not at all consistent with popular belief.

TABLE X.—DETAILED DATA FROM A TYPICAL COSMOPOLITAN HIGH SCHOOL.

	Total	Boys	Girls	9th	10th	11th	12th
Teacher	99	2	97	36	24	15	24
Engineer	77	77	..	27	23	19	8
Chemist	18	14	4	6	4	3	5
Pharmacist	14	14	..	4	4	5	1
Journalist	24	5	19	10	3	5	6
Archt. and Draftsman.	30	30	..	16	10	2	2
Physician	22	20	2	7	3	6	6
Lawyer	30	27	3	10	8	8	4
Minister	2	2	..	1	1	..	..
Stenographer	219	82	137	82	70	39	28
Accountants	53	27	26	22	16	9	6
Business	33	25	8	10	6	8	9
Salesman	12	12	..	6	4	2	..
Farmer	8	8	..	4	1	3	..
Nurse, etc.	25	..	25	11	8	3	3
Dressmaker	2	..	2	1	1	..	..
Librarian	7	..	7	3	2	2	..
Mechanic	38	38	..	17	15	4	2
Fine Arts	37	7	30	15	12	5	5
Miscellaneous	22	13	9	10	3	6	3
Undecided	445	249	196	171	160	95	19
	1217	652	565	469	378	139	131
Ratio				3.6	3.0	1.8	1.0

TABLE XI.—DATA FROM A HIGH SCHOOL IN A TYPICAL SMALL TOWN.

	Total	Boys	Girls	9th	10th	11th	12th
Teacher	59	2	57	18	18	16	7
Engineer	64	64	..	30	13	10	11
Journalist	3	2	1	1	..	2	..
Archt. and Draftsman.	4	4	..	2	..	1	1
Physician	19	17	2	5	3	3	8
Lawyer	6	6	..	..	2	1	3
Minister	3	2	1	1	..	1	1
Stenographer	80	1	79	29	15	19	17
Bookkeeper	23	6	17	12	8	3	..
Business	21	19	2	11	1	6	3
Salesman	5	5	..	2	1	2	..
Farmer	3	3	..	1	2	..	..
Mechanic	21	21	..	7	8	3	3
Nurse, etc.	40	..	40	14	13	10	3
Dressmaker	5	..	5	2	3	..	..
Fine Arts	19	4	15	4	3	6	6
Miscellaneous	14	8	6	5	4	4	1
Undecided	60	40	20	29	14	8	9
	449	204	245	173	109	94	73
Ratio				2.4	1.5	1.3	1.0

TABLE XII.—DATA FROM A TYPICAL RURAL HIGH SCHOOL.

	Total	Boys	Girls	9th	10th	11th	12th
Teacher	46	5	41	6	10	13	14
Engineer	17	17	..	2	4	5	6
Druggist	3	2	1	..	1	2	..
Journalist	3	1	2	1	..	..	2
Archt. and Draftsman.	7	7	..	4	3	..	..
Physician	1	1	..	..	..	..	2
Lawyer	4	4	..	1	..	1	2
Missionary	1	..	1	..	1	1	..
Stenographer	24	..	24	5	7	7	5
Bookkeeper	11	5	6	3	6	1	1
Business	10	9	1	2	4	4	..
Salesman	2	2	..	..	..	..	2
Farmer	14	14	..	8	4	1	1
Mechanic	9	9	..	7	2	..	..
Fine Arts	4	..	4	1	1	2	..
Nurse	14	..	14	7	5	2	..
Dressmaker	2	..	2	1	1	..	..
Miscellaneous	6	2	4	2	1	1	2
Undecided	67	36	31	33	14	12	8
	245	114	131	85	65	51	44
Ratio				1.9	1.5	1.2	1.0

6. Vocational or educational guidance are not in evidence, though much needed in the light of the study.

7. Special courses in high schools seem to influence the *distribution* of certain vocations among the four years of the high school but do not influence the *frequency* in the various schools. Those schools offering special courses do not exhibit any variation in occupational choice likely to be influenced by such courses from those schools which do not offer special work. Evidently the courses do not function as "finding courses."

8. Where marked variations from central tendencies occur, special investigation nearly always shows this due to the influence of a certain teacher, her work, special methods or superior or attractive equipment; sometimes also due to the "drive" of an enthusiastic personality.

9. Very large cities should be excluded from a study such as this covering state wide distribution and undertaken for generalized conclusions. They exhibit special and local problems, not, as a rule, comparable with those found in a given large population area, such as county or state.

Costume Designing in the Classroom

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THE limited time in the classroom makes it impossible to go into the subject of costume designing extensively. Still, I believe that many of the essentials can be learned with good results. Furthermore, it may plant the seed of good taste in dressing which will develop as the pupil grows. This knowledge may also help to check future extravagances of dress and increase still more the number of well dressed American women.

Fashion books were unknown until a fairly recent period. The only records of the dress in ancient times are found in wall carvings, paintings, and sculpture on monuments and tombs. However these were to commemorate some happening of the time rather than to give the future generations an idea of the costumes of those days.

There are various theories in regard to the beginning of clothing. A feeling of modesty or shame is one. Protection against the climate another. Some believe a desire for ornament or distinction brought about by ornamentation to be the cause. Carlyle said,

"The first spiritual need of a barbarous man is decoration."

The tattooing and painting of the body was followed by the hanging of ornament on the person. The waist offering the greatest opportunity, the girdle, apron, and skirt naturally developed from this custom. In the generations following, up to the present day, costume

PLATE I.

designing has come to mean, to quote Mr. Emil A. Hartman,

"Costume design is the art of decoratively creating raiment for women that will adequately protect the person from the peculiarities of the weather, conform with the traditional customs of the land where it is worn, reveal or hide through line, form and color the personal characteristics of the physique and answer the conventional needs of the occasion." So we see that we should not think of our clothing merely as a covering but rather see that this covering suits the form beneath, in line, color, and texture.

In costume designing lines are of great importance. Mr. Harry Collins says to consider the lines of the dress first and then the trimming. A gown with the

PLATE II.

important lines extending up and down will make the wearer appear taller. If to the contrary the important lines run around the figure the person will seem shorter. By this we see at once that a stout person should have perpendicular lines and a tall person horizontal lines. It is harder to design for a stout short figure and every effort should be used to suggest height and slenderness. First of all her gown should be simple and of dark coloring, though not necessarily black. Low luster material helps to give the desired effect. Set in sleeves are much better than kimona sleeves, and avoid white or light cuffs on your stout model for the eye is unconsciously drawn across from one cuff to the other and emphasizes her width. Deny her yokes and deep turn over collars with square corners. Convince her that a V shaped neck is what she needs. Soft clinging fabrics help in making the figure look smaller.

Plate I shows the stout, short, figure clothed in a gown with the lines running (a) perpendicular, and (b) with the lines running horizontally.

PLATE III.

Plate II shows the slender figure treated in the same way.

The drawing of the "layout" is out of the question for the average school classwork. Tracing around the figures in the fashion plates is one solution of the problem. As faces are very difficult for most pupils to draw, the head, arms and legs can be cut from the fashion plate and pasted into their proper places on the costume designed by the pupil. It is understood that the figure from which the head, arms, and legs have been cut has been traced around and used as the layout. Plate III shows the steps in this method. Silhouets found in advertisements can be converted into pleasing layouts. Plate IV shows the silhouet as it was in the paper and as it looks made over.

The costume models are always nearer the ideal proportion than the average woman. If you were de-

PLATE IV.

PLATE V.

signing for one special person you would take into consideration her good and bad points, but as we are designing for no one in particular we will not hamper ourselves with defects in our model but try rather to concentrate on the idea or design we wish to create.

All costumes designed, though they may have ideas from the same source, must be treated in a distinctly individual manner and suited to the age of the wearer. A child of 12, a girl of 20, and a woman of 45 would each need different treatment. Plate V shows the dress from which each of the other two were taken.

Every fashion and details of fashion of the present day may be traced to that of some former period. Greek costumes of the classic period have given greater inspiration than any other to the designers in the past and present day. In creating a design the designer does not, however, need to go back to the Greeks for there are various other sources that he may go to for inspiration. The modern fashion plate holds an unlimited amount of material, to say nothing of the gowns worn on the street or shown in the shop windows and "fashion shows." Nature suggests many possibilities as well as do common place objects surrounding you. If you look closely you will find that there is something in the old comb-back rocker besides antiquity. The lines in this old rocker serve as a suggestion for a suit as shown in Plate VI.

Plate VII shows how a Luna moth may suggest a negligee.

Plate VIII illustrates how a coat may be created with its idea taken from a child's dress in a modern fashion plate. It is just as permissible to use line and detail from modern fashions as it is from those of older periods. Sometimes the idea for one design may be traced to a half dozen sources with a more pleasing result than any one of the originals.

Plate IX shows the adaptation of a period costume to the modern gown.

In choosing colors in dress select with more thought for the complexion, features, and personality, rather than the eyes.

"Make the color match the eyes" is such a familiar expression, and yet a brown eyed person with bright complexion might be able to wear colors that a brown eyed person with a sallow complexion could not possibly wear. Colors as well as lines play an important part in dress. The elderly person should be more conservative in color as well as line. The young girl can wear more intense colors and extreme styles, while a child can indulge in light airy clothes with ribbon and fluffy trimmings.

The following is a list of colors and what they typify.

Red—suggests heat and excitement. It should be used in small areas or in neutralized tones on a dress for it is a very advancing color.

Orange—is a mellow, rich, full-bodied color. It too suggests heat and excitement, also light and happiness. Like red it must be used with discretion.

Yellow—imparts warmth, buoyancy, cheer and happiness. Yellow should not be used on figures of large expanse. As a rule, in a gown, tints or neutralized tones should be used.

Green—combines the light and warmth of yellow with the coolness and restfulness of blue. It is passive, cool and retiring.

PLATE VI.

Blue—is passive, cool, restful, quiet color. It is the one color that all types can wear. In its neutralized tones it is exceptionally good for stout people, due to its receding qualities. It has been said that blue is the blessing for many American women, and that abroad we are known by our blue costume.

Violet—is a combination of the qualities of blue and red. The effect of coolness, restfulness and quiet, with the contrasting effect of excitement, depends upon the amount of blue or red in the violet. The dominant hue causes the result. All tones of violet are good with the socalled red haired type.

The adaptation of color to seasons of the year is thought of more in late years. Browns, russets, oranges

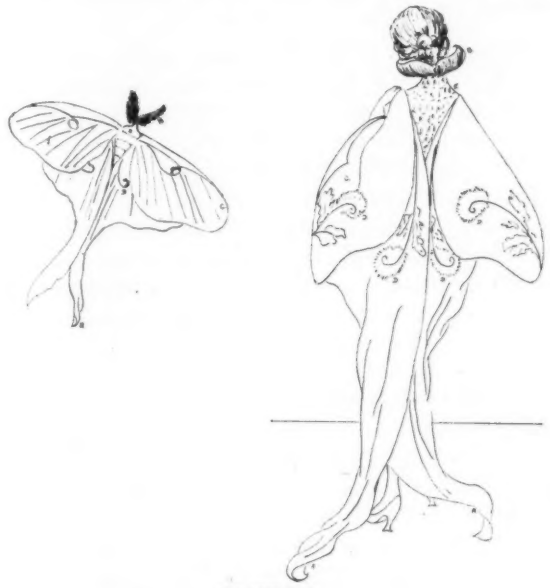

PLATE VII.

and purple seem to blend with the fall atmosphere. Spring suggests yellow-greens, yellow-orange, etc.

Having your color is not enough, for you must next decide what type can wear them. Of course you must remember that there are exceptions to all rules and you will have to rely upon your good taste and common sense when occasion requires.

There is the blond-haired type with a clear complexion of good color, and with deep blue eyes. She can wear any tone of yellow that is partly neutralized. Blues and blue-greens, also blue-violets. Reds used as bits of trimming is permissible, but only as such. Gray, black and white, also yellow-orange may be placed upon the list for her to choose.

The fair blond with pale complexion and gray-blue eyes is too lifeless to wear gray, black or white. Black and white are allowable though as trimmings. Blues and violets are her colors and if she wishes, dark shades of green.

The florid brunette, with dark brown hair and eyes, with dark complexion but good color, may wear either

PLATE VIII.

black or white especially the cream and ivory whites. If she wears gray a silvery gray is best. Brown, reds, dark green and blue without a purple tinge are good.

A mature woman with a sallow complexion should wear cream instead of white. She should avoid brown, green, yellow, and purple and red except in dull tones with the combination of white used at the neck. A warm gray is allowable and black if used with cream

PLATE IX.

white and a touch of bright color. Very dark and navy blue are good.

The red hair type with a fair, ruddy complexion and gray-green eyes finds black and gray good, but white should be used only as trimming. Reds, oranges and yellows in neutralized tones are allowable. Blues and all shades of violet are good. Greens maybe, if dark or bronze.

In designing a costume some of the things to be considered besides the personality of the person are:

1. Is she stout or slender, tall or short?
2. Her complexion.
3. Her eyes, her hair.
4. Her temperament.
5. Is she quiet and retiring, or active and aggressive?
6. Is she young or old?
7. Occupation.
8. Her station in life.
9. The occasion for which the gown is to be worn.
10. The season of the year.
11. The kind of fabric that is to be used.
12. The good points in the figure that are to be brought out, and the defects that are to be covered up.

Methods of Teaching Industrial English

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IT may well be argued that English, being a language, is a means of thought and of expression, and that as such it may be used in industrial work as well as in the other walks of life. However, it must be evident to all that the industries use not only highly specialized terms and phrases but also apply special meanings to many of the common words to such a degree that a lecture, a book, or even a conversation embodying them would be unintelligible to the uninitiated. In addition there are numerous forms and usages which are found only in the industries, and for which there must be special preparation.

Not only must the pupil who is receiving training in the industries acquire the vocabulary of the trades—to the end that he may properly understand articles and books of his trade, and intelligently receive orders in his daily work—but he must also be able to use these words, terms and phrases in such a manner as will carry conviction. He must be able to speak clearly, forcibly and to the point; he must have the ability to write with a well developed power of description, exposition and argumentation. This means that he requires training in subject matter, in judgment of subject matter and in the selection of subject matter.

The preparation of the teacher of industrial English should be equal to that of the teacher in charge of the college-preparatory English. In addition to all this, however, there must be considerable training on the industrial side. This experience may be obtained through special courses, provided for that purpose, or it may be acquired through a *live* participation in the intersts of the shop work which the pupils, who are under the care of the teacher, are taking at the same time. This requires that the English teacher visit the shops *continually*, develop a sympathetic understanding of the work of all the pupils and a true appreciation of their viewpoints. It is in these visits that the teacher will learn the vocabulary of the shops.

This knowledge of vocabulary is only one step in the preparation of the industrial English teacher. It is necessary, just as bricks are necessary for a brick building, but as in the case of the building, construction is possible only through the skillful use of material, so in industrial English the emphasis must be laid upon the skill of construction—upon expression, both oral and written. In addition to the actual vocabulary there must be a knowledge of the proper use of the terms and phrases; industrial English is a technical language, just as the language of any profession. The difference between the two is that the professional language grows with the profession, built as a superstructure upon a college-preparatory course of English; industrial English has as its foundations only the preparation which the pupils have had in the grades. The industrial pupil, then, must learn English and industrial English at the same time. The preparation of the teacher must be guided by a consideration of this condition, and industrial English must be sought in its habitat—the shops.

Other sources of preparatory material are the trade journals, important for both their articles and their advertising pages; and advertising booklets and catalogs. These should be used also as subject matter in teaching industrial English. It must be understood that no amount of preparation, no amount of subject matter, can ever prepare a teacher to handle this subject; the teacher must grow with the teaching—the preparation is continuous. The world goes on, especially the scientific and the industrial world, and he who would stand still is left behind.

Next to the preparation of the teacher in importance is the equipment for teaching industrial English. The room should be considered as an English laboratory. Tables, rather than desks, should be used, and the chairs should be movable. Provision should be made for charts of a technical nature, drawings made by both teacher and pupil, maps of an economic value, cases for books and magazines, shelves for models and parts of machinery, card indices of various kinds, filing cabinets, and, most surely, a bulletin board. The room should be the library of the shop, books being set aside for that purpose from the general library, and, in some cities,

from the public library. These books should be for the use of the technical teachers as well as for the pupils. A large amount of blackboard area is most desirable; about forty feet, at least. Everything should be so arranged and managed that the room may become both a place for efficient work and effective enjoyment.

The bulletin board should be the center of daily interest, the pupils being trained to look there upon entering the room, and the teacher taking up a consideration of the latest bulletins before beginning the scheduled work for the day. The bulletins should consist of cuttings from the newspapers and magazines, both reading matter and advertisements, items of interest to some of the boys at least. (One of the English teacher's duties is to help bring about a tolerance of the other trades than the one in which the pupils are particularly interested.) The pupils should be encouraged to bring in items which they think would be of interest; the teacher reading every offering before posting it on the bulletin board. These items need not be limited to matters of interest to the trades alone; they may be concerned with fake inventions, examples of wrong scientific explanations, and even cartoons, if they point a distinct lesson. The purpose of the bulletin board is to offer as many opportunities as possible for general knowledge; to impress the correct and to train in the detection of the wrong and the fallacious.

Before considering the actual methods of teaching industrial English it may be well to examine the objectives of the course. Why do we teach industrial English? Any language is a tool for use in thinking, receiving information, and in giving out the results of the combination of receiving and thinking. It is, or should be, a constantly changing tool, becoming better and better adapted to the purpose for which it is intended, and it is not to be compared with a mechanic's tool which wears out even with the best of care. The word "tool" is used for the lack of a better term, to signify the *usefulness* of the subject, rather than to consider English, or any other language, as an objective in itself. The emphasis should be placed upon a development of activity, combined with an alertness of receptivity; the aesthetics of English are out of place in the industrial course. We are continually demanding expression on the part of the pupil; the slogan—"No impression without expression" is a favorite one; then we dam that expression at the fountain head by rules of the best diction, by standards of literary values, by "do's" and "don'ts" until the ambition dries up and the pupil becomes a kind of machine turning out "fabricated" English according to standards not his; he becomes a piece worker. The methods of industrial English, then, should be directed toward the production of expression, both oral and written. This general objective can be obtained only through the development of clearness, force and earnestness; through insistence upon exactness, completeness and seriousness.

A good beginning may be made by a series of short talks by the teacher, the pupils being told in advance that they would be expected to write briefly the substance of the talk. They may or may not take notes as they wish. The subject matter of each talk should be concerned with industrial work, requiring not more than five minutes for delivery, and carefully prepared so as to contain only one main topic. In the place of a talk a short article of a like nature may be read. The time of writing should be limited to five minutes, the papers then being collected and read to the class, without divulging the names of the writers. Criticism should be requested and the recitation socialized within reasonable limits, the teacher confining the remarks to a definite consideration of the subject matter by means of one or more of these questions: Is the statement clear? Is it forceful? Is it exact? Is it complete? Is it earnest? Thus there should constantly be held before the class the desirability of developing the *ideal* of clearness, the *ideal* of exactness, the *ideal* of completeness. It is only in the establishment of ideals that education becomes something far greater than the acquisition of information.

The value of these preliminary exercises is twofold: The pupils begin to set up their own personal standards, (at least they think that the standards are their own), and they begin to learn the meaning of words, that is, something more than the dictionary meaning. During the whole course the teacher should seize every opportunity for pointing out many examples of definite and exact meanings, as well as showing the possibilities of various shades of meanings. It may not be out of place to call attention to the basis of punning and joking—seriousness is best obtained through an appreciation of the non-serious. The lack of this appreciation has turned many a serious talk into a farce. In this connection are many possibilities for discussing the origin of words and the making of the English vocabulary.

The next step is to assign readings for mental digesting—the same assignment to all the pupils, and during the class period. After silent reading the pupils are to be called upon, with open books, to state paragraph by paragraph, the real meaning of the printed statements. Again the socialized recitation may be effective, if properly controlled. Finally comes the individual assignment for outside preparation, the digest in this case also being mental, the report being given with the book open. After that may come the written work, but the assignments should be moderately brief if a satisfactory digest is to be expected.

In these reports, mental or written digests, there will be much slang and a very great amount of atrocious English, all of which may make the English teacher wince unless it is kept in mind that the chief objective is expression — self-expression, if you will. The self-confidence of each pupil in his ability to "put

over" the idea is the first, and most important, step in his education; the best means of expression should be so gradually introduced as to make him think that they are *his* methods.

Following these reports on books or articles there may be reports on the actual work in the shops, or reports of visits to commercial shops. These visits should be made mostly as individuals, not as a class. The shop teachers will undoubtedly take their classes to shops, with the view of teaching shop practices; the visits for the sake of reports for industrial English will be far more efficient if made as individuals. These reports may be read to the class, especially if they are of interest to the class, or they may be read by the teacher privately. Too many reports before the class will become very tiresome, and this method should be pursued only to establish criteria by which conscious standards of expression may be established.

The subject matter of these reports may be treated in such a manner as to bring out the four general divisions of English expression. Thus narration may be of things, description of principles, exposition of processes and argumentation concerning problems which are met in the various industries. The teacher of industrial English will strive to develop an appreciation of these divisions, indicating clearly where each part may be used to the best advantage.

Special exercises in the various forms of English expression should be given. These will come under the head of business reports and letters, of which the most important forms are needed for the following purposes: Answering advertisements, applying for a position, making requisitions, making reports, ordering goods, making suggestions to superiors and writing orders to inferiors. As in the case of reports and digests, these samples of English expression may be criticized before the class until proper standards have been acquired.

Part of the work should be devoted to the human side of the trades—to the sociological conditions of the various industries. This may be treated through talks by the teacher and directed reports by the pupils of articles and books. The subject matter should be concerned with biographies of men who have become noted in their trades and industries; it may deal with the difficulties which the industries have overcome in their development; the prevention of accidents in the industries and the care of the employees may be a part of this work. The proper relation of the industries to the rest of society should be studied, as well as the place of man in both society and industry. This study will give many opportunities for discussing social customs, business customs, and the advantages of establishing and maintaining these customs. It may be said that all of these considerations rightfully belong to a course in economics; however, it may well be the subject matter for pupils in the first year of high school, for obtaining expression in English as applied to the industries. The real study of economics may come in the last year of high school, when the emphasis will be upon the principles of economics, rather than upon the subject matter.

No one can rightfully claim that a course of one year in industrial English can give all that is necessary to equip a pupil to take his place in the industries. It can, however, establish standards, ideals and a knowledge of terms and phrases, through the use of which the pupil may continue to educate himself.

Organizing and Establishing a Trade Class in Bricklaying

Geo. S. Sanders, Salt Lake City, Utah.

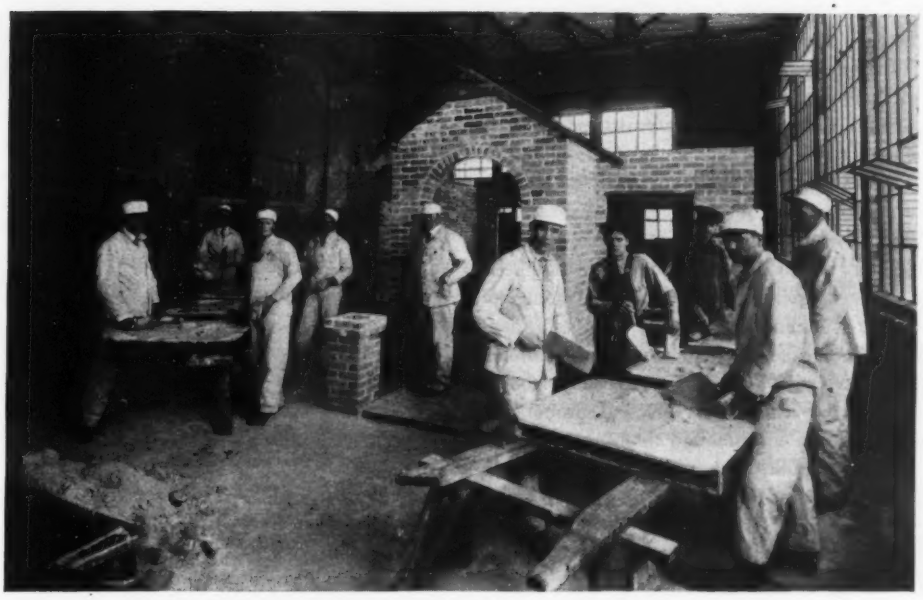
LAST summer the attention of the Utah State Department of Vocational Education was directed to the fact that there was an acute shortage of bricklayers, plasterers, and painters in the state, and we were asked if something could not be done to relieve this condition. The following account shows how this matter was handled and the results which are now being obtained.

The first step was to find out whether or not there was a serious shortage of skilled labor in these trades and to find out what would be the attitude of all parties concerned in the establishment of special classes for teaching these trades.

General contractors were first visited and all had the same complaint namely, that if one large building was to be constructed there would not be enough brickmasons in the state to carry it through to completion. They were heartily in favor of such classes being established.

Due to the limited funds at our disposal, we decided to limit our investigation to the bricklaying trade only. Brick contractors and the brick masons' union were next interviewed and all seemed to approve of such a move-

CLASS BUILDING CHIMNEYS.



GENERAL VIEW OF THE SHOP WITH CLASS AT WORK.

ment. At a special meeting of the union, it was voted to support our plans and help in whatever way was possible.

The information obtained from these interviews seemed to justify the establishment of a course in bricklaying. An advisory committee was appointed by the state supervisor of trade and industrial education, which met at the state school offices. This committee consisted of one representative each from the contractors, the bricklaying union, the building supply houses, the associated industries, the city schools, the state department of vocational education.

Among the subjects discussed by this committee were the following:

1. Place to hold class and for construction work.
2. Funds.
3. Selection of instructor. His training.
4. Scope of work to be given in this class.
5. Course of study.
6. Records for employers' benefit.
7. Agreement with trades for an opportunity to work on buildings under construction or to erect a building.
8. Status of students after leaving training.
9. Methods of publicity.
10. Sub-Committees to be formed.
    (1) Finances.
    (2) Courses of Study.
    (3) Draft Committee.
    (4) Equipment and Supplies.

The support of the city superintendent of schools was sought with the result that permission was granted us to conduct this class in suitable quarters at the West High School Technical Building.

At a special meeting of the Utah Fire Clay Products' association a fund of $1,000 was voted to be placed at our disposal and the statement was made that more funds would be forthcoming if needed. The state department of vocational education partially matched this sum with $500, the total amount being sufficient for the instructor's salary. Hardware stores, brick companies, lime and plaster companies, all contributed supplies and equipment in sufficient amounts to assure the operation of the class.

A number of successful bricklayers and contractors were mentioned as suitable instructors. Realizing the necessity of securing a good reliable and efficient tradesman for this position, the state supervisor visited all all these men and finally decided upon Mr. J. E. Trowbridge as the man for the job.

Mr. Trowbridge was then "put through" an intensive teacher-training course and sent to a number of cities in the central states, where classes in bricklaying were being held to observe methods and content of courses.

Notice of this course being offered at the West High School was published in the newspapers, but when school opened in September there was an enrollment of only one. After the first week had passed and no more had enrolled, the advisory committee was called together to discuss what should be done. As a result of this conference, on Sunday morning and for three successive days the following adv. appeared in the papers under the help wanted column:—

WANTED—Fifteen or twenty industrious young men to learn brick-laying trade. Earn while you learn. Apply from 9:00 to 11:00 A. M. at State Department of Education, Room 223 State Capital. After 6:00 P. M. call Hy. 5033R.

It wasn't difficult to select fifteen intelligent and energetic young men from the numerous applicants to assure the class being held on Tuesday. Phone calls and letters came in from all parts of the state.

The class is held daily from 8 a. m. until noon. Contractors are cooperating by giving these young men whenever possible, work in the afternoons. Despite the fact that the majority of these young men are married and have from one to three children and that work has

not been forthcoming regularly every afternoon, not one member of the class has dropped out but all are enthusiastic and willing to put up with hardships until the completion of their course in the spring.

An agreement with the unions permitting the boys to work on outside brick work has not been attempted as yet, neither has the status of the students after leaving the class been discussed due to a number of reasons. We did not at first know how much of the trade could be taught "inside" but due to the large room with high ceiling, and the efficient teaching which has been done, we feel that the class is a complete success. The establishment of this class is not an effort to "break" the unions. We are going to have the "open and closed shop" movement explained to the students by efficient proponents of both associations and are inclined to think it best to let matters rest there and watch results.

The following outline briefly shows what is being taught:

A. Preliminary knowledge
   1. Making a mortar bed
   2. Making a slack box
   3. Making mortar
      (a) Slacking lime
      (b) Sanding lime
      (c) Tempering to proper consistency
   4. Knowledge of tools and equipment
   5. Spreading mortar
      Etc.

B. Foundations
   1. Kinds
   2. Excavating
   3. Leveling
   4. Footings
      (a) Kinds, sizes and depth
   5. Drainage and water-proofing
   6. Laying out
      Etc.

C. Walls
   1. Kinds and sizes
      (a) Brick, tile, veneer
   2. Bonds
      Etc.

D. Chimneys
   1. Kinds and sizes
   2. Drafts
   3. Flue linings
      Etc.

E. Openings
   1. Doors
   2. Windows
   3. Bull's eyes
   4. Arches
      (a) Elliptical
      (b) Semi-circle
      (c) Segment
      (d) Camber
      (e) Jack
      Etc.

F. Fireplaces
   1. Kinds and sizes
   2. Draft
   3. Hearths
   4. Choke
      Etc.

G. Steps, Walks and Floors
   1. Herring bone and straight bond
   2. Flat and on edge
      Etc.

H. Assay Furnaces
   1. Sizes and kinds
   2. Muffle arch
   3. Main bearing arch
   4. Firebrick lining
   5. Common brick face
   6. Laying out muffle arch
   7. Cutting of brick for muffle arch
      Etc.

A WALL AND CHIMNEY PROBLEM UNDER CONSTRUCTION.

I. Boiler Setting
   1. Laying out
   2. Bridge wall and shape
   3. Fire brick lining
   4. Combustion chamber arrangement
   5. Arching boiler
   6. Various types of arching boilers
   7. Construction of feed door arches
      Etc.

J. Blue Print Reading

K. Estimating

A number of jobs are now being done by this class for the high school which will save a considerable amount of money to the school board.

It was our desire to charge no tuition for this course, but due to the necessity of retaining every learner until the course was completed, and the cost per student for training, we decided upon the following plan. To charge a tuition of $10, about $8.50 of this amount was expended for a good set of bricklayer's tools. These tools become the property of the student provided he finishes the course. The remaining $1.50 was used to defray towel and locker fees. This plan is working out very nicely.

After all details were worked out the class was turned over to the city schools. Inasmuch as federal funds are expended for part of the instructor's salary there is a certain amount of supervision for which the state department of vocational education is responsible.

We feel that a good job of teaching is being done and that a real help to industry has been started and we are anxiously awaiting to see the outcome of our efforts. How well the men can do the work under actual working conditions and how they will finally fit into the industry remains to be seen.

Enlarge Vocational School. The trustees of the Vocational School, at New Bedford, Mass., have inspected plans for the enlargement of the vocational school to furnish additional accommodations for the rapidly growing school. The plans provide for a building erected in the form of a hollow square, with the main offices and classrooms facing on one street, the girls' building on another, the machine shop and carpentry shop on another street, and the power and electrical shop on another street. All of the interior carpentry, wiring and finishing of the building is to be done by the boys' vocational classes as practice work.

Staining and Varnishing Cabinet Work in a High School Course

G. M. Nyman, Cincinnati, Ohio.

FROM an educational standpoint the field of finishing in the high school course is rather limited. It must necessarily remain a side issue.

The boy has little opportunity to exercise his brain in constructive thinking. He learns that certain materials have to be applied in proper sequence, and the result may be good, bad or indifferent according to how closely the boy follows the formula laid down and how much care and skill he displays in the different operations.

It is evident that with an expenditure of from twelve to 24 hours in the school year on the subject, the student will be lacking that, which, from the finisher's standpoint, is most desirable—namely, skill. And skill can only be acquired by constant practice.

Finishing, as it is practiced in the trade today, is highly specialized and demands more skill than knowledge. The foreman-finisher, to be sure, must have a vast knowledge of a large list of materials and their nature, to be able to tell how the different ingredients will act singly or in combination when applied to various woods.

Good results in finishing can only be obtained on the proper foundation and that foundation is a carefully prepared surface. It is folly to expect a good finish on objects, assembled from parts that still retain the mill marks or blemishes, caused by rough and careless handling. The thing to do is to "clean" each exposed surface before the final assembling or gluing up. The term, "cleaning up" involves all the processes needed to leave the surface absolutely smooth. This may simply mean running the parts through or over a power sander, or it may mean smoothing, scraping and sanding by hand. Previous to cleaning, all parts should be inspected for possible defects. Compressions or dents should be moistened so as to give the fibres a chance to swell and retain their normal position. Machine cuts or tears, if too deep, should be filled with some material that will take the same color as the finished whole. On darker woods, burned-in shellac will do well, but on light wood—oak, finished natural for example—a mixture of very thin glue and wood dust, colored with yellow ocher, and chalk will give fine results. This must, however, be given time to dry before it can be cleaned off.

Assembling does not rightfully come under the head of finishing, but unless the boy is sufficiently impressed with the absolute necessity of cleanliness and the orderly procedure of assembling, he is likely to spoil the good work done in cleaning up the parts. When assembled, the object should, with a few minor touches, be ready for sponging. Sponging is the process of going over the surfaces with a sponge, moistened in water, for the purpose of raising the surface fibers. The roughened surface, when dry, is then smoothed down with fine sandpaper and will later resist the actions of stain or shellac, which otherwise would tend to raise the fibers. Sponging will also show up possible mars and scratches so they can be eliminated. All surfaces should thereafter be brushed and dusted well to remove loose dirt and dust from clogged pores before any finishing material is applied.

A boy is too easily satisfied with his own efforts when it comes to producing a surface that will bring forth the full beauty of the wood. He does not know, and it is hard to make him understand, that "a surface, well cleaned, is half finished."

Indeed, the founder of the sloyd system went a step further and said: "The beauty of wood is self-sufficient, and it does not need stain and other applications for its enhancement." However, articles that are to be handled need some protective coating, and we also believe that this protective coating can be made to enhance the natural beauty.

Appreciation of anything is usually in direct ratio to cost of acquiring that appreciation, hence the extra energy expended by the teacher and the pupil will give the latter visions and appreciation of a far-reaching industrial subject.

Limitation of time, facilities, apparatus and materials, force the teacher to seek for ways and means that will give the best results under this handicap.

The chief requirement in good finishing is skill in application and that the inexperienced boy cannot supply. It is educationally more valuable to do a simple thing well than to bungle the more complex.

Natural finishes will give the best results in the school shop and are very pleasing. To finish oak, for example: Fill with natural filler, according to manufacturer's instructions. When dry, give the article two coats of clear varnish; sand down the second coat, when thoroughly dry, with fine sandpaper No. 00; dust off and apply the last or flowing coat of varnish. If a dull surface is desired, this may be rubbed down with pumice and rubbing oil. When sanding on varnish or shellac, it is well to put some linseed oil on the sandpaper to prevent white scratches. The oil will not injure further applications of varnish, as it is the same oil of which the varnish is made and combines with it.

Shellac Finish.

Because of its quick-drying qualities, shellac has been the main stand-by in the school shop. These same qualities, however, make it difficult to apply. The few occasions a boy has to use shellac during the year do not

give him the skill necessary to apply it successfully. The chief difficulties are inability of the boy to judge the consistency of shellac—the volatile nature of the liquid tends to constant changes—and, as a rule, the shellac is applied too thick. The second drawback is that the boy looks upon shellac as a sort of paint and applies it accordingly; that is, he cannot resist the temptation to go back over the ground already covered when he sees dull spots, caused by faster evaporation or absorption.

A good way to apply shellac is to use a block, about the size of a sanding-block, cover it with upholstery plush, and use this as a brush. It is possible to shellac a large surface by means of this plush block in a short time. A small surface can be covered in one stroke and the result is surprisingly good. If the plush is kept moist, it can be used repeatedly.

A simple, natural finish for small articles made of close-grained wood is as follows: After sponging and sanding, apply one coat of shellac, sand slightly and rub off with waste, moistened with thin shellac and linseed oil in proportions of one oil to ten of shellac, and just enough of the two to make the pad moist. This finish will harden the surface, keep it clean, show up the grain and it is equally adaptable to turned and stained surfaces. The pad and plush block should be kept moist in a baking powder can as they improve with keeping.

Stains.

For general utility, ease of handling, transparency and non-fading qualities, there is nothing better than water stains.

There are two groups of these. In one the stain is produced by the chemical action of alkalies or acids on the wood. Bichromate of potash (potassium bichromate) is a good example. The other group contains the great number of water-soluble powders or crystals, which can be obtained from paint and varnish houses. Walnut crystals, dissolved in boiled water, will give a cheap stain that covers all requirements in brown. It is commonly used in Europe; in fact, it is about the only thing used for browns on all kinds of wood. The two groups of water stains can be mixed so as to get the chemical action of the first with the coloring of the latter, and different shades are thereby obtainable.

The use of potassium bichromate as a mordant in blue-printing is familiar. Its use can be successfully extended to almost all water stains for color fixing and intensifying.

Oil Stains.

Most all commercially-prepared stains come under this group. The main objection to them is that they fade and do not penetrate deeply, are likely to be rubbed off in spots when the filler is applied, because the liquid in the filler acts as a solvent on the underlying oil stain. To some extent this may be overcome by the use of a wash-coat of very thin shellac, made by adding five more parts of alcohol. It takes some skill to apply the wash-coat, because the alcohol is also a solvent and therefore likely to spoil the stain.

About the only oil stain that can be recommended for the school shop is the asphaltum, which is reasonable in price, is easy to apply, and by thinning it with turpentine, makes a wide range of browns possible.

Spirit Stains.

Difficulty of application and high cost prevent the use of this stain in the school shop. However, two spirit-soluble anilines should be on hand; black for ebony finishes and Bismarck brown for touching up defects on mahogany finishes, where water or oil stains would not be effective.

Wood Fillers.

Most of the wood filler, used in the school shop, comes prepared in one pound cans, but if a larger quantity is needed, it pays to make it up in the shop. The chief ingredients are silex (ground rock), binder (linseed oil), and drier (Japan) with or without coloring matter. The best silex is ground from the rock in its natural state and the particles are sharper than when the rock is burned before it is ground. The S. C. Johnson Co., of Racine, Wisconsin, manufacture a mahogany filler of excellent quality. Before applying a colored filler, the surface should be given a wash-coat of shellac. This tends to bind the stain and harden the fibers, which will result in a much clearer surface. The better results may be explained by the fact that the wash-coat prevents the fibers from absorbing the color of the filler and then later only gets in the pores as it should.

Varnishes.

Under existing conditions, where the boy buys his own finishing materials, waste and poor results are almost inevitable. Left to his own initiative, his purchase of finishing materials will mean the buying of a can of varnish-stain. Ten-cent stores and paint dealers all seem to be pushing this article. Three coats of this, applied by a boy, will spoil the appearance of even a good piece of woodwork. The remedy lies in group-purchase under the instruction of the teacher and, if the shop is run under the group-production method, this arrangement is very satisfactory. The objections to all gum and oil varnishes are slow drying, stickiness, lack of resistance to water and other liquids, and quick deterioration.

The coming material for finishing and one which will overcome the handicap of the school shop in comparison with the more ideal condition of the commercial finishing room is pyroxylin, a comparatively new product. Pyroxylin is a product of cotton and includes both wood lacquers and wood enamels. Their most valuable advantages are their toughness, their quick drying and adhesive qualities. They will dry hard from thirty to forty times faster than a high grade varnish or enamel. Pyroxylin finishes are stronger, being made so as to resist accidental scuffing and marring. They are waterproof, resist steam, gasoline and oil, and do not get sticky or tacky. To the touch such a finish is

pleasant, presenting a smooth, velvety surface which is not affected by body heat, entirely unlike the sticky, unpleasant feel of some finishes.

However, at present the quick drying properties of pyroxylin render it hard to apply with a brush. To overcome this, the writer has thinned it down about 50 per cent with a special thinner prepared by the manufacturer. This diluted lacquer or varnish was applied on the parts with a soft brush before assembling and good results were obtained. It is especially fine when a thin, strong, transparent coating is desired.

These new lacquers work something like shellac and must be applied in much the same manner, that is, flowed on with rapid brush strokes, covering the full length of the object if possible. They require a plain surface, without obstacles, to get results with the brush.

Western Arts Association, St. Louis, Mo.

May 1, 2, 3, and 4.

E. J. Lake

The thirtieth annual convention of the Western Arts Association has gone into history as one of the most successful meetings of this pioneer organization of teachers of the arts in the schools of the Central States. This association has in practice, as well as name, associated the increasing special interests of the industrial and fine arts in education. The meeting of this year reflected a fine spirit of cooperation between the teachers of the various related subjects. Round-table programs and discussions on art, home economics, vocational teaching, printing and manual training were held alternately with programs in which topics of general interest to the several groups were presented.

On Monday evening previous to the meetings of the arts association, a conference of shop teachers and supervisors was called by Dr. Wm. T. Bawden, of the United States Bureau of Education, at which the subject "Manual Arts in Junior High Schools" was discussed. This preliminary meeting under Dr. Bawden's direction has now become an established and valuable feature of the annual meeting of The Western Arts Association.

Seven general sessions were held at which topics were presented by experts in each as follows:

"The Art of Teaching the Arts," by Professor Arthur Dean, of Columbia University, New York.

"Better Home Making," by Ross Crane of St. Louis.

"Educational Values in Industrial Arts," by Leon L. Winslow, Specialist in Art and Industrial Arts Education, University of the State of New York, Albany, N. Y.

"The Schools and the Printing Industry," by Wm. Guy Martin, Managing Director of the Ben Franklin Club of St. Louis.

"The Organization of a State Program of Art Education," by C. Valentine Kirby, State Director of Art, for the state of Pennsylvania.

"Our Renaissance in Home Making," by Mrs. Frances V. Ward, Division of Extension, Washington University, St. Louis, Mo.

"Greater Use of Art," by Mr. E. H. Wuerpel, Director Washington University School of Fine Arts, St. Louis, Mo.

"Art in the Public Library," by Mary Powell, Art Librarian, St. Louis, Mo.

"The Problem of the Relation of Industries and Fine Arts to the Modern Program of Education," by Mr. Chas. S. Meek, Superintendent of Schools, Toledo, Ohio.

The general meetings were held in the spacious and beautiful Palm Room of the Chase Hotel and in the auditorium of the Soldan High School. Exhibits were held in the main floor parlors of the Chase Hotel, and though reduced in quantity over previous exhibitions of the Association, were select and splendidly presented to illustrate the varied work of the schools. The various schools of the city of St. Louis were represented by a well arranged exhibit showing a wide range of excellent work.

The elected officers of the Association for the next year are:

President: W. H. Vogel, Director of Art Instruction, Cincinnati, Ohio.

Vice-President: Frances Mason, Director of Art, Boone, Iowa.

Auditor: Harold Gossett, Indianapolis, Indiana.

Miss H. Estelle Hayden of Des Moines, Iowa, the retiring President, was elected to the Council.

L. R. Abbott, Director of Manual Training and Industrial Education, Grand Rapids, Michigan, was reelected Secretary-Treasurer of the Association.

No definite place of meeting for next year could be decided upon and the matter of selecting a place for the meeting is in the hands of the Council. It was decided to hold the meeting at the time of previous meetings, during the first week of May.

COMMERCIAL EXHIBITS AT ST. LOUIS.

The commercial exhibits proved to be an interesting part of the Western Arts Association Convention. The manufacturers exhibiting included the following:

American Crayon Co., Sandusky, Ohio.—Crayon, chalk and art materials.

American Type Founders Co., Jersey City, N. J.—Printing equipment and supplies.

Abbott Educational Co., Chicago, Ill.—Art materials and supplies.

Barnhart Bros. & Spindler, Chicago, Ill.—Printing equipment and supplies.

Binney & Smith Co., New York, N. Y.—Crayon, chalk and art materials.

Milton Bradley Co., Springfield, Mass.—Art materials and supplies.

Bruce Publishing Co., Milwaukee, Wis.—Vocational textbooks.

Brown Robertson Co., New York, N. Y.—Picture study prints.

Thomas Charles Co., Chicago, Ill.—Art materials and supplies.

Devoe & Raynolds Co., Chicago & New York.—Paints, artist materials and supplies.

Joseph Dixon Crucible Co., Jersey City, N. J.—Drawing pencils.

Favor, Ruhl & Co., Chicago, Ill.—Art supplies, drawing paper.

S. C. Johnson & Son, Racine, Wis.—Wood finishes.

Laclede-Christy Co., St. Louis, Mo.—Laclede modeling clay.

Manual Arts Press, Peoria, Ill.—Vocational textbooks.

Practical Drawing Co., Dallas, Tex.—Drawing books and supplies.

The Prang Co., Chicago, Ill.—Art materials and supplies.

Stanley Rule & Level Co., New Britain, Conn.—Small tools.

Simonds Saw & Steel Co., Fitchburg, Mass.—Saws and files.

Frederick Post Co., Chicago, Ill.—Drawing instruments and supplies.

Walburn Kling & Co., Chicago, Ill.—Art materials and supplies.

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN

Editors

EDITORIAL

THE CARNEGIE FOUNDATION REPORT.

The forces of educational reaction are having their inning at last. Not able to prevent the modern movement for diversified school activities and an enriched curriculum by an argument on the merits of the case, they now seize upon the problem of taxation and the increased cost of public education in an attempt to swing the pendulum back to the three R's and "some acquaintance with the processes and results of science."

Some statements from the Carnegie report sound like voices from the tomb of medieval Europe. With reference to the popular confidence in universal education, note the following: "The result of this popular devotion to a single form of social training is, first of all, a pressure to bring into the schools and to retain in them great numbers of pupils whose intellectual endowment is ill-suited for formal study, but who have, in many cases, marked ability for other fields of activity. In no country of the world does so large a proportion of the energy of the teaching profession devote itself to the tedious task of lifting ill-prepared children and youths through courses of study from which they gain little or no good. The over-emphasis on education, and in particular on higher education, as the sole opening for the youth of the country has not only filled the schools with ill-assorted pupils, but has closed the minds of people to the opportunities offered by agencies other than the school. For example, in the trades today there are numberless openings in which the remuneration is high and which offer a life of satisfaction and usefulness."

Being interpreted, this means first of all, that the public schools are to be closed to those who are "ill-fitted for formal study but who have marked ability for other fields." The public schools must be reserved for the bespectacled, pampered prodigies who would be kicked off of the athletic field, or out of the shops, where those of "marked ability for other fields" are getting ready to do the work of the world.

No complaint is registered in the report against the "formal study" and the "courses from which they gain little or no good." The argument is that if the children do not fit the courses, throw the children out of school. The modern notion is that if the courses do not fit the children, *change the courses.* The children who have "marked ability for other fields" are as fully entitled to the privileges and assistance of public schools supported by public funds as are the favored and fortunate ones who are fitted for "formal study."

Another disheartening feature of this part of the report is the assumption that the "trades and technical callings" can be carried on by those "ill-fitted for formal study." The duties of the trade and industrial world, therefore, require no intellect. The worker needs no training of the public schools for his task, no training for citizenship. All he needs from this medieval point of view, is "marked ability for other fields." This is about as naive a piece of fatalistic folly as we have read in many a day.

The entire argument is against the introduction of diversified courses to meet the needs of diversified talents. It harks back to the good old days of the narrow and restricted curriculum and the "mastery of a few things," the assumption being that with the enriched curriculum, nothing is mastered, and that each student must, perforce, dissipate his energies among the various subjects offered. This is indeed possible, just as it was possible and quite the common thing under the old regime of the limited curriculum, to fool away one's time and dissipate one's energies. The whole question turns on the individual aptitude and interest and the individual determination. The appeal of the modern curriculum is much stronger, and with earnest students, there is a greater mastery acquired now by students of elementary and high school age than ever in the history of public schools. The assumption of lack of mastery and of superficiality and insincerity is not well grounded, so far as our best high schools are concerned. The enriched curriculum simply offers a greater variety of subjects from which to select the few to be mastered.

Furthermore, it is erroneous to assume that the subjects that constitute the modern enriched curriculum do not lend themselves to cultural and intellectual development. Why it is that abstract mathematics will give culture and intellectual training when unapplied, but will cease to be cultural when applied to mechanics, problems of electricity, structural steel work, and machine shop practice, remains an unfathomable mystery.

If we know the temper of the American people, they will gladly pay the cost of the enriched curriculum that meets the needs of "all the children of all the people."

THE COMPETENT TEACHER.

The teacher who does not assume some professional obligations outside of the classroom will very soon find that he has nothing but a job which is little more than a daily routine of class exercises.

The children under such a teacher will very soon find that they too are going through a monotonous routine of daily class exercises and will take every chance to vary the program by mischief.

There is certain discipline for teacher and pupils in the desire to do something well. The teacher can secure this discipline for himself and for the school by constant and active interest in the whole plan and purpose of school work. No teacher can hope to interest many pupils in her specialty as a specialty. A teacher can

interest every normal pupil in any school subject by finding related interests in the subject.

To sustain this interest the teacher must cooperate with other teachers and with the community life. The American teacher has a splendid opportunity to cooperate with other teachers and with the community through the school, church and civic organizations that are so numerous in every community in America. No other school subject has the range of contact and the advantage of so many related interests as the industrial arts. The entire range of incentives in education is reflected in this subject and the teacher who succeeds in it must have the incentives of education in his mind and heart.

MORE TIMELY MEETINGS.

The annual meetings of teachers of the industrial arts have again held excellent programs and exhibitions at a very great expenditure of time and energy on the part of leading teachers. These are almost the only large sectional meetings of teachers in the public schools that are held so late in the school year and while the schools are in session.

One reason given for holding the meetings of the Eastern and Western Arts associations so late in the school year is the need of having adequate work for exhibition. Even the week of Easter, which is a partial holiday for most public schools is objected to, on the ground that the work of the year cannot be secured for exhibition by that time. This, we believe, could be accomplished by teachers retaining the late work of one year for the exhibition of the next year. The increasing cost of programs and exhibitions can apparently only be reduced per capita. They should be made available to greater numbers. Would it not be possible to secure a more general attendance of teachers of the arts during the Easter recess? We would like to see it tried.

SCIENCE AND ART.

We have been given to understand that the beauties of nature and art are regulated by the contours and intersections of the diagonals of a hexagon. Charts show conclusively that important lines and accents of the best in art conform to the diagram or "web" of triangles based on the hexagon. We have accepted without question the "golden proportion" as desirable. We are convinced that proportions that are secured by parallel or normal diagnosis are alike and therefore harmonious. We are almost convinced that sequence in the most interesting forms of nature and art is regulated by geometrical device. We respond to the genius of Mr. Hambridge and see clearly that he has discovered geometrical diagrams for much of the finest space relations in design. We hope definite use may be made of these diagrams and hope especially that their use will relieve school design of haphazard results. In fact we are convinced that design is never haphazard. Art is never haphazard. Science is of course never haphazard. May we not therefore look to the regulation of art by science?

May we find in a correlation between Art and Science the solution of our pedagogical difficulties with the arts? Shall we hope that when science has discovered the secrets of art we can teach art by the same methods now employed for science? May we not design a landscape; table; chair or what-not under geometrical adjustment and be assured of perfect beauty and propriety? Art will be completely identified.

The work of masters will be carefully scrutinized to discover whether they conform to scientific regulation. All of the emotional qualities of fine art will be subject to scientific production.

Will they? Not while you or I are concerned with art. Not while art is the expression of racial or individual emotion. Not while art is art; for science and art differ in this one important essential that art is emotional and science is not.

A UNIQUE COMPLAINT.

A complaint that the project method of instruction interferes with the plan of instruction now generally adopted by teachers of art comes to us from a teacher of teachers of art in a normal school. This strikes us as a unique complaint because we had cherished the thought that art could be taught, if at all, by the project method, and that the manual arts teachers have employed project teaching in distinction from the methods of teachers of other school subjects.

The project method in the final analysis insures against academic routine which consists of telling and directing, without the educational process of depending on the student to do a little thinking, planning and original devising of his own.

The conception that children go to school to learn things that books and teachers give and that the responsibility of the teacher ends with letter perfect results is too absurd to need reflection.

The arts can never be taught that way. Children can not even be interested in that kind of program. The human animal differs from other creatures in that he must be engaged in some individual project in order to develop the faculties which he possesses in *distinction* from other creatures.

A program of drawing, design, making in the name of art that is disturbed by the necessity of the project method may be safely and advisedly disturbed. It might better be discarded and a well directed series of projects substituted.

CHANGES OF ADDRESS.

Subscribers to the Industrial-Arts Magazine who expect to change their addresses during the summer months are requested to kindly send both their old and new addresses to the Subscription Department, The Industrial-Arts Magazine, Milwaukee, Wis.

At least two weeks are required for making changes. Copies of the Magazine lost through failure to give notice of changes of address cannot be supplied beyond the current issue.

THE SHEET METAL SHOP IN THE STRONG JUNIOR HIGH SCHOOL.

Sheet and Art Metal Work

As it is Done in Strong Junior High School, Grand Rapids, Mich.

H. M. Dexter, Instructor.

Teachers of sheet metal work in junior high schools are not a unit whether the project method or the production method is preferable in teaching sheet metal. My idea is to teach on the production basis, using simple exercise projects to introduce the fundamental operations. The demand for sheet metal work by the Grand Rapids board of education is sufficient to warrant our teaching the subject on the production basis.

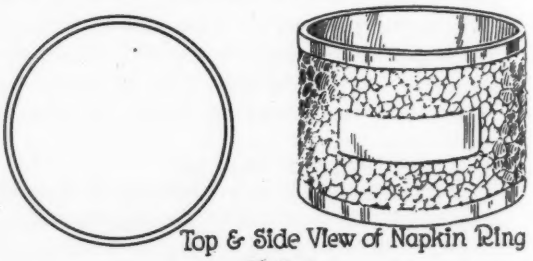
We are making in the sheet metal shop of the Strong Junior High School many articles which the Grand Rapids schools need. We have just finished 75 square waste baskets, 85 floor mop pails, and 36 ash cans. We are now making for the cooking rooms of the school 300 copper table-leg boots. The purpose of these boots is to keep the tables from moving and to protect them from the janitor's mops and brushes.

Our boys are also working such metals as copper, brass and silver. They make articles for their parents, their friends and themselves. Many of the boys sell their finished products to help meet their living costs. By working different kinds of metals in our shop the boys are receiving experience in different processes used in metal working. They are learning soft soldering, silver soldering, brazing, riveting, all kinds of seaming and joining of metals. They also get practical experience in oxidizing metals, on metal spinning, electroplating, etching and chasing. All of this has a distinct educational as well as a vocational value.

In copper, brass and silver, the classes are making finger bowls, nut bowls, cigar jars, salt and pepper shakers, cream and sugar sets, coffee pots and tea pots, nut picks, fruit knives, fern dishes, trays, coffee cups and saucers, teaspoons, ladles, ink holders, pen trays, book ends, picture frames, stamp boxes, jewelry boxes, candy boxes, flower vases, table laps, flower baskets, powder boxes, cake plates, serving trays, candle sticks, colonial candle sticks, letter openers, napkin rings, hair receivers, crumb trays and scrapers, clocks, stationery holders, loving cups, canteens with Indian heads, bar pins, incense burners, pin trays, wine jugs, sherbet cups, collar boxes, door knockers, umbrella handles, hand mirrors and brushes, umbrella stands, book markers, water pitchers, candelabra, hall lanterns.

The first thing I have my pupils begin to do in sheet metal is either a cookie cutter or a drinking cup. In art metal work they begin on a napkin ring or an envelope opener.

It is not necessary to explain the making of a cookie cutter or a drinking cup as practically all readers of this article are familiar with this kind of work. But as there will be relatively few who understand the work done in art metal, I shall explain the making of a napkin ring and of other articles along this line. (See Fig. 1.)



Top & Side View of Napkin Ring

—FIG. 1—

We take copper 16 or 18 guage 5" by 1¼" in size. This is first pickled, that is, placed in a dilute solution of sulphuric acid. After this the metal is given a dip in a strong solution of common salt and water. Then it is rinsed in clean, cold water and scrubbed with sand until bright. When the metal is bright it is rinsed with fresh water and dried with sawdust.

The pupils then hammer-finish it with the round end of the ball peen hammer. After the piece is hammered it is flattened out with a mallet. The edges are filed straight and the ends are straightened and squared up. We then measure the metal again and cut it 5" long.

The next operation is to bend the metal over a round iron with a wooden mallet. It need not be exactly round at this time, but care should be taken that the two ends meet perfectly.

Now comes the brazing. We take spelter (an alloy of copper and zinc) and put it in a clean copper or glass dish and add some powdered borax. After mixing the spelter and borax, we take a little of the mixture and place it inside on the joint of the napkin ring. We then heat the ring over a plumber's torch, or a gas-and-compressed-air

flame, or over a coke fire (not coal.) When the spelter melts and runs all over the joint nicely, we cool the ring in fresh water. Then after drying it we round out the ring perfectly over a round tool.

The joint is slightly filed and hammered again so that it will not show. Again, we dip the ring in a sulphuric acid solution and transfer at once into a salt water solution, where it should remain from ten to twenty minutes, until all the oxide and burned borax are removed. We then rinse it again, and scrub it until it is bright, and dry it with sawdust.

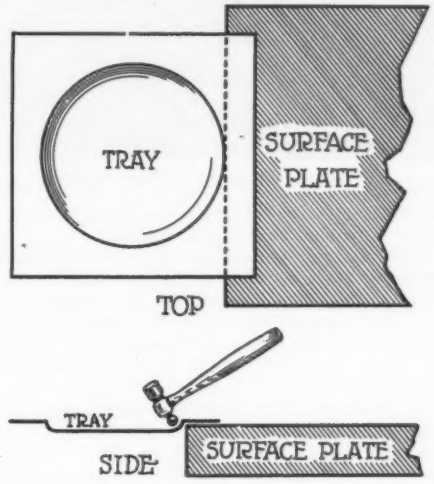
Now comes the decoration. This can be done either by etching or engraving. In either case, the desired lettering or design is first drawn directly on the ring. If the ring is to be etched, the boy paints the design with black asphalt, making a border on both edges and covering all the inside of the ring with asphalt. After the asphalt is dried, which will take from three to six hours, the napkin ring is dipped in a dilute solution of nitric acid and kept there from ten to thirty minutes, according to the strength of the solution and the temperature of the room. In warm weather it is not necessary that the ring remain in the acid as long as when the solution is cold.

When the design has been etched to a sufficient depth, the ring is rinsed off in water and given a gasoline bath, using a brush, until the asphalt is dissolved. Then the ring is again dried in sawdust. Care must be taken not to remove the ring from the gasoline bath to the water as the metal cannot be cleaned in this way. After the metal is dry it is examined to see if the edges were roughened while etching, and these are filed smooth and sandpapered.

The finish is done by oxidizing, or polishing, or by silver and nickel plating. No matter what finish is put on the ring the final finish is lacquering.

As the second problem in art metal work, pupils usually desire to make a pin tray, cut out of 22-guage copper, about 5" square. This piece of copper is dipped in a dilute sulphuric acid and next in a solution of salt and water. Then it is rinsed in fresh water and scrubbed with sand until bright. It is dried in sawdust, then hammer-finished all over. Find the exact center of the piece and draw a 3½" circle. With the aid of a surface plate the tray is now formed. (Fig. 2.) Place the metal on the plate with circle above the edge. Beat down a little inside of the circle with the ball peen hammer. Care should be taken that the hammer does not strike out of the circle lest it cut into or through the metal. If the hammer or the edge of the surface plate cuts into the metal a very easy break may occur.

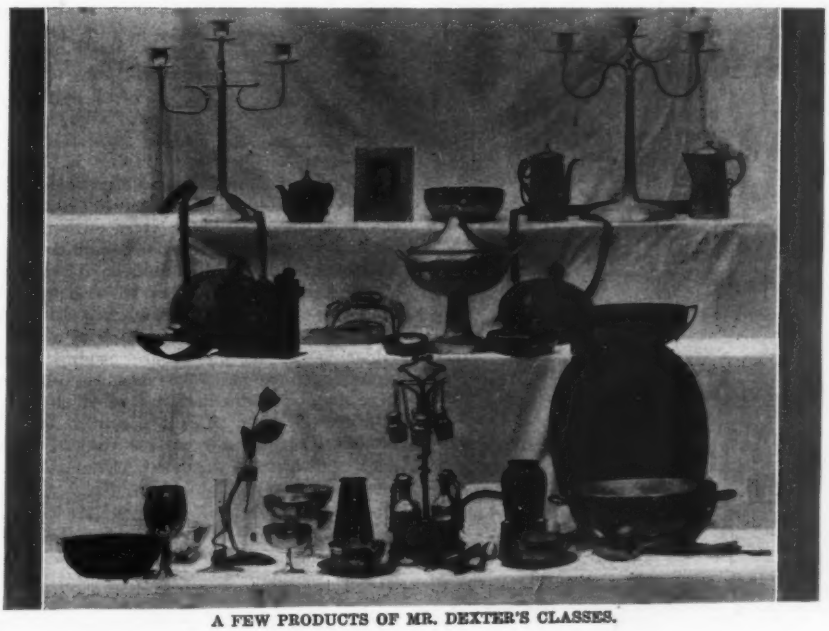
After the inside of the circle has been beaten down about one-quarter of an inch, tighten a piece of hard wood with sharp edges in the vise, then with the ball peen



—FIG. 2—

hammer, hammer it down inside of the circle. Flatten the square rim outside the circle and set the compass again in the center of the circle, and see if the sunken part of the tray is perfectly round. Press the point of the divider a little bit into the center so it will show on the other side of the metal. This indicates the exact center on the under side. Draw a circle on the outside of the tray about one-eighth of an inch inside of the edge of the metal. Now, with a sharp shears, cut the little tray exactly square by cutting to the outer circle, then making it octagon, using a 45 degree triangle, adjusting it to a sheet metal workers' squaring shears. This will help the worker to cut the tray exactly octagonal. The edges may now be sandpapered.

For decoration the tray may be chased, engraved or etched with any design desired, or it may be finished by



A FEW PRODUCTS OF MR. DEXTER'S CLASSES.

ADVANCED WORK IN COPPER AND SILVER.

nickel plating, silver plating, oxidizing, or by polishing bright. The final finish is lacquering.

After the pupils have made two or three things in art metal they are free to make their own choice. We have in the shop a list of everything that comes to mind that can be made in our shop. There is also in the shop a show case of articles produced in the shop by pupils and myself. This helps the pupils to see in advance how the article they wish to make will look when finished. The majority of the pupils pick out for their third or forth article a collar box or a jewelry box.

Collar boxes are made 6½" in diameter with a slightly raised top. A design is chased in the top and a brass knob is set in the center. The making of the side of a collar box is similar to the work of a napkin ring.

Cut out from a piece of 22 guage metal a piece 22" long, and 3" wide. Pickle and scrub, dry in sawdust and then hammer the whole piece of metal. Square the edges and cut the piece to a length of 21 inches. Bend and braze the two ends, making a butt joint, the same as in the ring. After brazing, clean up again and round perfectly with a wooden mallet on a round tool. Care should be taken, when rounding, not to hammer the edges of the band. This would cause the edges to stretch and would make the box wider at the edges than in the middle. When the band is perfectly round, take the sheet metal worker's beader and make a bead, about ⅜" from one edge. This bead will ornament the top edge of the box, and also keep it from bending.

Measure the inside diameter on the bottom of the band. Cut a disk of 17 or 18 guage metal, the exact size of the diameter of the bottom and fit tightly in the inside. Some chloride of zinc or a composition flux, made of one-half glycerine and muriatic acid, should now be applied with a small brush all around the inside of the box where the bottom is set in. Heat with a plumber's torch or gas flame and solder with soft solder all around.

The top of the box is cut out of 22 guage metal, about ½" larger in diameter than the size of the top of the box. This metal is cleaned, scrubbed, dried and hammered as described before. Raise out the inside of the cover about ½". The cover is tried to see if it is perfectly round, and if found to be so, a burr about 3/16" or ¼" is drawn up with a sheet metal worker's burring machine all around the edge of the cover. Care should be taken to make the cover fit the box not too tightly.

A TEA SET IN COPPER.

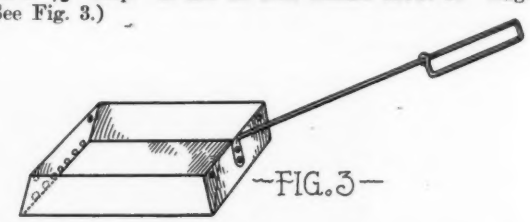
The box cover is now filled with molten lead. After this is cool a design is drawn on top of the cover, and with chasing tools is cut into the metal. Care should be taken that the tools have a rounded edge so they will not cut through the metal. When the design is complete, remove the lead.

On a turning lathe turn a brass knob about ⅝" diameter. This is soft soldered at the center on the cover. Do not use any soldering coppers with art metal work as the method cannot be successfully used.

The collar box is usually finished by oxidizing, although it is sometimes nickeled or silver plated.

Attention must be paid to the cleaning of this box before plating. As its bottom and knob are soft soldered, it cannot be cleaned with sulphuric acid because the acid will badly blacken the soft solder and prevent it from taking the plating or oxide. Before plating this article it should be cleaned with a solution of cyanide of potassium, This does not blacken soft solder. After the box is clean, scrub it until not only bright but chemically clean. Do not dry the box but hang it immediately in the copper plating solution where it should be left for about 20 minutes. It is now dipped in fresh water again, given a slight scrubbing, rinsed, and given a dip into a very weak solution of sulphurated potash. This process enables the worker to give the box any color desired. After this is done, the piece is rinsed again in fresh water, dried with sawdust and finally lacquered.

Before further explanations are made about the work in art metal more information should be given about soft soldering. Even though brazing or silver soldering are most frequently used in art metal, there are many times when soft solder is preferred for certain parts of an article. In soldering art metal work, it is not practical to use the heavy bar of solder such as the sheet metal worker buys from the hardware store. It is best to melt the bar of solder in an iron ladle (do not overheat) and to add to it some pure tin to make the solder finer. Before the solder is melted, a square little pan of 24-guage black sheet iron is made. This has folded corners and it measures 3"x3" and is ½" deep. It has an iron handle about 12" long. (See Fig. 3.)



—FIG. 3—

Three or four ⅛" diameter holes are punched in the front bottom edge of the pan. Now place on the workbench a sheet of black iron or copper. Set down the little pan, on the farthest edge of the sheet of metal and fill it full of the melted solder. Then raise up the handle of the pan and pull slowly toward you. When you reach the edge of the sheet start again as before. In this way thin, round solder wires, which are of the most value in soldering on art metal, are produced. These wires can be made in any thickness to suit the worker. If a thicker wire is wanted the pan is pulled slowly, thus giving the solder more time to flow through the holes. If the pan is drawn faster finer wires result. If necessary the wires may be drawn as fine as 1/64".

People not accustomed to the blow pipe for soft soldering should be very careful not to overheat the metal while soldering. Of course the worker will not have very much difficulty to detect such overheating because the job will be spoiled. There will be no help for the worker in that case. The work should then be cooled and scraped with a sharp scraper or cleaned some other way.

The Auto Mechanics Course in Consolidated Schools

Chas. Fleischman, Boise, Ida.

MANY educational movements develop in an illogical order. The auto mechanics movement is one of these. By all rules new movements should develop where there is a direct and vital need for them. Yet we see the automotive courses developed and specialized in the city schools while the consolidated rural schools, owning and operating a string of busses, are usually without them. If any place should be vitally interested in this work, it is the rural community where the school is directly interested in automotive transportation and the people are nearly all using self-propelled machinery.

The problem of introducing this work is not at all complicated, although it is different from establishing the same work in the city. The busses, some of the tools, and the garage space are necessary whether the work in auto-mechanics is given or not, and the saving in the care and repair of the school transportation system will materially help to pay for the additional space and equipment necessary in introducing the work.

The instructor should be a practical man with some special training in his line of work and some work in educational theory and practice. He should be the superintendent of transportation, and all the busses should be directly under his control. He could very well drive one of the routes regularly if provided for in his schedule. Driving one of them regularly would enable him to keep in close touch with the condition of each of the busses, as he could change twice daily if necessary. If driving a regular route, he should be free from any other school routine.

The repair shop should be in connection with the garage and should be equipped with a forge, an oxy-acetylene welding outfit, a lathe, a drill press, an air compressor, and a good assortment of hand tools. The forging should be planned to fit the automotive work and the exercises should lead up to the making and tempering of tools and the straightening of bent parts. It is a waste of time, so far as automotive work is concerned, to spend time on the usual exercises in a regular course in forging. A gate hook has its place as a forge problem, but as an automotive problem in forging an all-metal screw driver with a twisted handle is better. Many special tools, including hollow punches and shim cutting tools, can be made at the forge and placed in the tool room of the shop.

The oxy-acetylene welding outfit has been one of the greatest boons to the rural community. It has enabled the prompt repair of parts which formerly had to be replaced by parts ordered from a distance. It is of added advantage that repairs can be made in a very short time. Such an outfit is a necessity in any good repair shop at the present time, and it should be one of the first things purchased. Broken desk castings, furnace parts, and parts of farm machinery belonging to the school, furnish excellent exercises in motivated work. The boys may also bring parts from home to be fixed by themselves at a small charge to cover cost of materials used. All the boys should have exercises in steel and cast iron welding and in brazing, while some may be allowed to weld brass and aluminum. The latter work should usually be part of a special course in welding.

A lathe is very desirable and is found in most garages today. It enables one to make special equipment or to duplicate parts which one needs. A lathe with a milling and keyway cutting attachment, a tool post attachment for grinding, a thread cutting dial, and a taper attachment, will permit the turning out of nearly any automobile part and the making of miniature parts for demonstration. Nothing makes a crankshaft as real to a pupil as actually turning one out on the lathe. With the proper milling tools and provisions for tempering reamers, resetting tools, and many other tools may be made on the lathe.

The drill press will be used as often as anything in the shop, and it provides a means of refacing valves if a lathe is not available. An air compressor is desirable and one may be made from an old motorcycle engine. The cams should be removed and the inlet valve fixed to operate from atmospheric pressure. The outlet should be fitted with a small poppet valve, opening outward to act as a check valve. The air tank may be omitted if the check valve on the end of the hose is omitted. Air pressure is valuable in cleaning automobile parts. In addition to the drill press, a breast drill or a portable electric drill (where power is available), is a necessity.

A good plan of organization is to have crews of two or three men working together. This allows all of the equipment to be utilized at once. Where only one man can work on a machine at a time the odd men can be used on the shop crews in the work of overhauling cars. If the right kind of a man is chosen for this work, it will not be a problem to find cars to overhaul but, rather, a problem of selecting the most useful jobs from an educational standpoint.

Where the semester plan is used six crews are desirable, working progressively from one kind of work to another, and changing work each week. There can very well be a lathe crew, a forge crew, an oxy-acetylene welding crew (to include soldering), a tool room crew, and two shop crews. Twelve boys will keep an instructor busy in the shop and this will provide crews of two men each. An odd man from the lathe and one from the tool room crew will in reality furnish three shop crews.

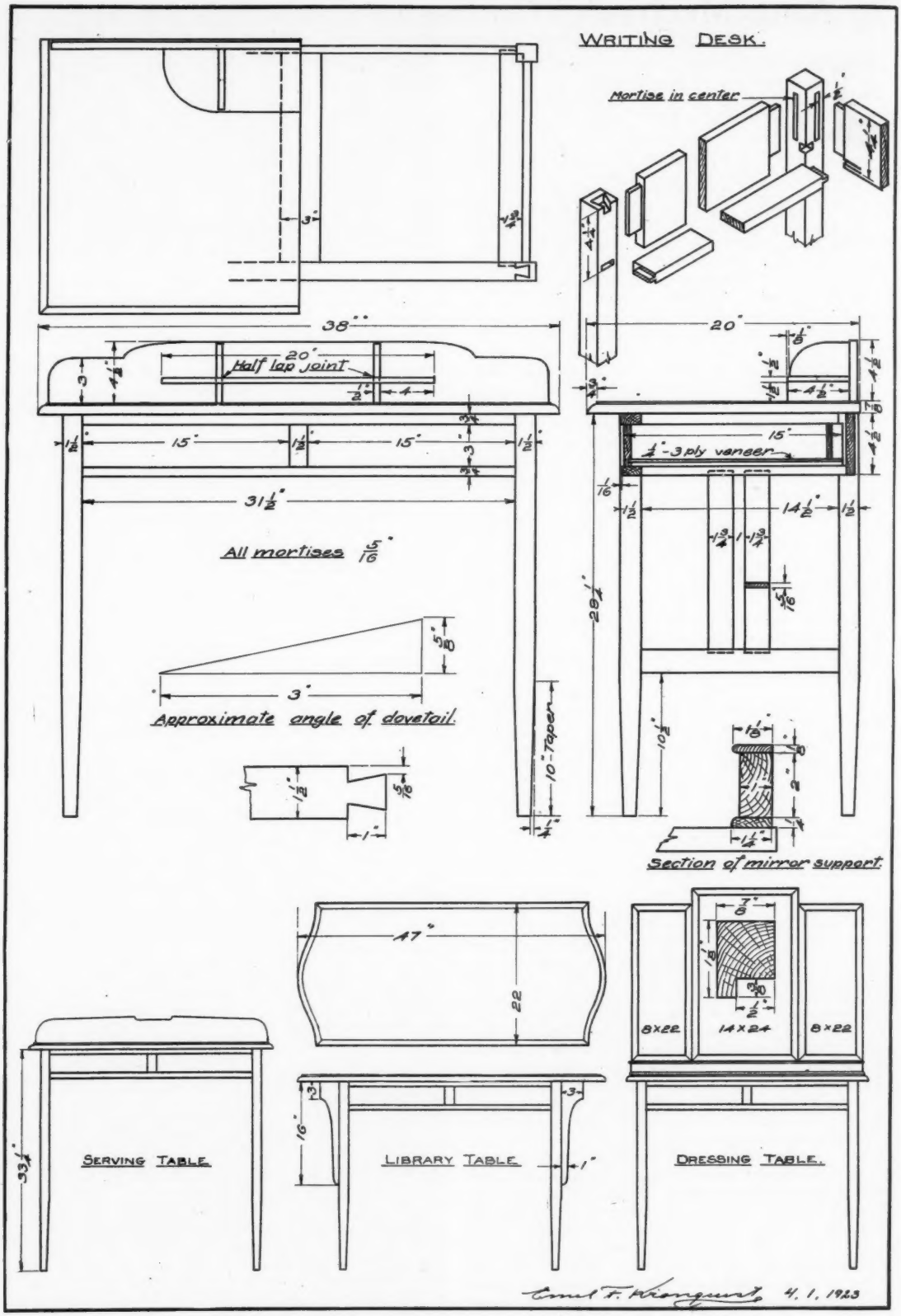
Under the quarter plan, the six-crew organization could be used or a four-crew system could be used. Under this plan one of the shop men would take charge of the tool room and the second shop crew would be made up of odd men from other crews. With either plan, each boy would get an equal opportunity in the different kinds of work. This would be impossible if each one only used the machines as he found occasion in doing some shop job.

Each job coming into the shop should furnish an educational problem and rush work should never be accepted except in advanced classes. All machine operations should lead up to regular shop problems and the elementary shop work should be on old equipment. This may be obtained for a small outlay or gratis. Automobile and accessory companies are very glad to furnish catalogs, charts and oftentimes samples, or models, of their wares. Local garages often have enough worn parts to furnish a complete assembly of some units and usually are glad to present these to the school. They are glad to loan other parts of wrecked cars.

An evening class for adults will secure very close community cooperation with the school. Such a course will bring the fathers into the school as nothing else can, and they will gladly pay a tuition fee which will cover all costs. This must be held during the winter months when the farmers can get away from their work for two evenings per week.

In fact the auto-mechanics work in the consolidated school will keep the boys interested in school, secure community cooperation, solve most of the transportation problems, and furnish the training which will add enough to the life of expensive machinery to pay for the installation and maintenance of the work.

Industrial Education at Westinghouse High School. A recent survey of the classes at the Westinghouse High School, Pittsburgh, Pa., with particular reference to boys electing technical courses, has indicated the necessity of taking immediate action toward providing the necessary equipment for such work. It is necessary to provide, ready for use on the opening of the new building, at least three additional shops, a combined motor mechanics and machine shop, an electrical shop and print shop.



DETAILS OF THE FOUR-IN-ONE PROBLEM.

2. WRITING DESK.

5. SWING TABLE.

3. WRITING DESK.

A Four-in-One Problem

Emil F. Kronquist, Washington High School, Milwaukee, Wis.

THE subject of cabinet making is given as a sophomore subject in the manual arts course in the Milwaukee high schools. One of our big problems has been to think out a piece of work suitable for class instruction along the production type of work, because all classes, both in the various shops and drafting rooms have about 24 students enrolled, so the individual type of work has become out of the question. Our particular school has grown from 300 students ten years ago to 1800 students today.

As an experiment a "four-in-one" problem was attempted with two beginning classes in cabinet making. The boys were shown four different tables (apparently) and asked to select or decide on any one of the four models.

In figure 1 we have a table for the living room; it may be called a library table. In figures 2 and 3 we have a writing desk with some suitable pigeon-hole arrangement. In figure 4 a three-mirror dressing table for a bedroom. In figure 5 a serving table for the dining room.

The kind of material and finish to be used was left for each individual to choose for himself so that the finished product would harmonize with the other pieces of furniture in the home. Some of the dressing tables were finished in ivory enamel. All these table frames are exactly alike in size and construction, except the serving table which has legs four inches longer.

Careful organization of the work is of course necessary so that each group of boys with its foreman is kept busy, and all the different woodworking machines are used at all times during the class hour which is 50 minutes long.

The characteristics of the various woods used in the furniture industries, the manufacturing, grading, selection of lumber are discussed before any work is begun.

A good deal of time is spent in demonstrating the operation of each machine; why the jointer levels one side of a piece of wood; why it is dangerous to run a short piece of stock over the jointer; why safty guards should be used; why the planer will make the opposite side

1. LIBRARY TABLE.

4. DRESSING TABLE.

of a piece of stock parallel to the first side; why the planer does not level a piece of stock if one surface has not previously been leveled by the jointer, etc.

A careful study of the detail drawing is made and a stock list made out. Different groups of boys were assigned to get out the stock for the various parts, another group of boys cut it to rough sizes. No milling was attempted before the entire stock bill was out. Jigs were used whenever possible and provision made for the rotation of jobs. With the mill work completed the wood was matched up and given to each individual to dress, scrape, sand, glue up and finish.

To put across a piece of work like this with large classes it is essential that it be carefully planned to the smallest detail. The instructor must know exactly what each group of boys is to do before classes convene. This cannot be done unless the man in charge is willing to work and puts forth his best efforts. It has been my experience from observation that the teacher who only puts in the school hours and can afford to leave with the boys when school is out is the least successful. He contributes very little to the advancement of his profession, in fact, I think the school would be better off without him. It is remarkably few manual training teachers you find with initiative or with an ability for original conception and independent action. Most of them are perfectly willing to do what they are told to do and let it go at that.

This "four in one" problem worked out well in our school and a great deal of interest was created. Forty-seven different tables were finished, made from seven different kinds of wood, and each boy anxious to take home his work because it was well done.

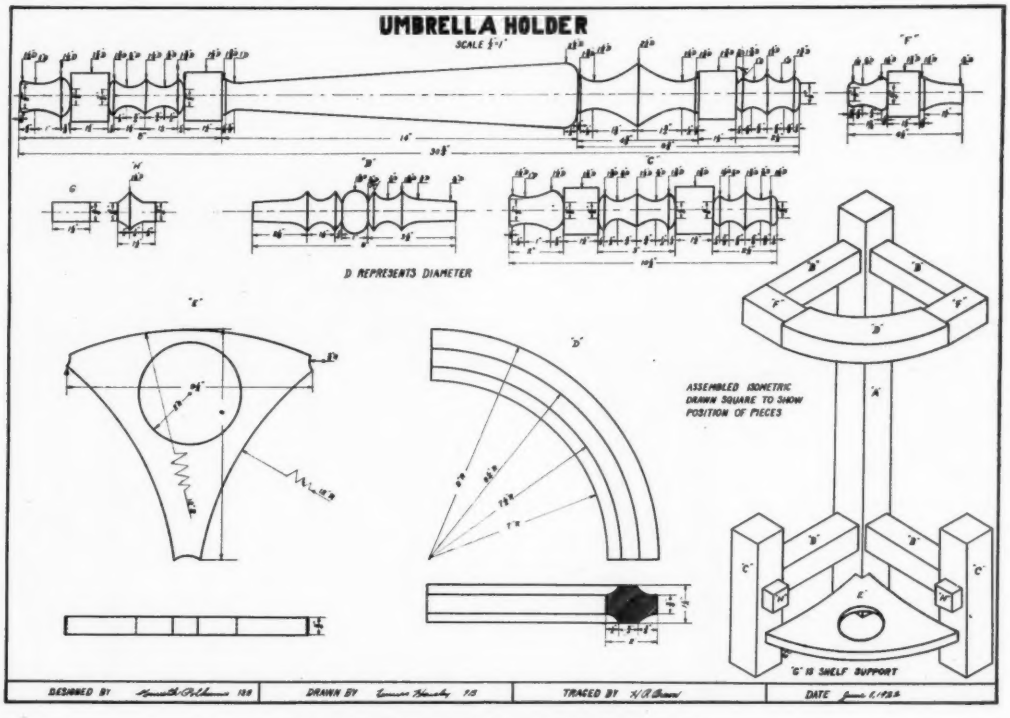
A Year's Work by Senior High School Students in Advanced Cabinet Turning

Glen D. Brown, Muncie, Ind.

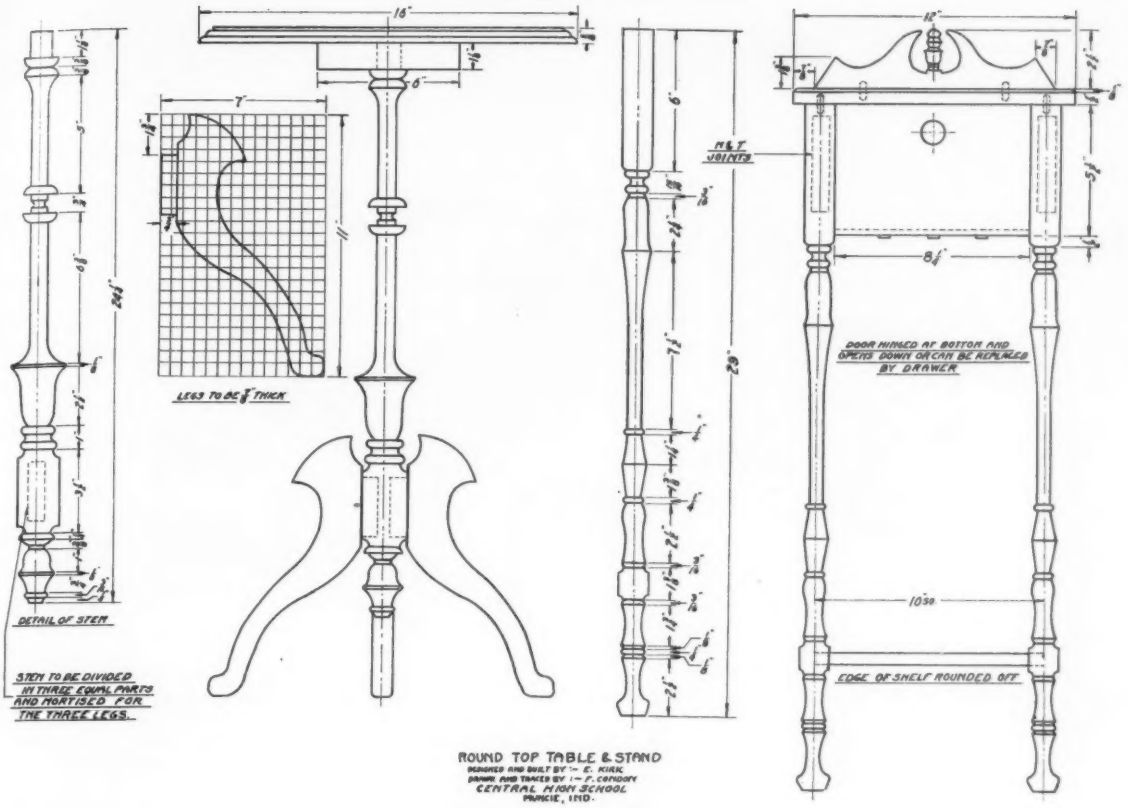
THE accompanying drawings and photographs of an umbrella stand, chaise lounge, tables, and other projects made in the manual arts department of the Muncie Central High School, embody our idea of what should be accomplished by high school students who have attained some knowledge and skill in turning which can be applied directly to modern furniture design and construction.

These projects not only have instilled greater appreciation of furniture design among various pupils but also have presented problems which involve a variety of hand and machine tool operations of utmost worth to the learner. Veining, shaping, and turning, involving a variety of cuts. while not intricate, call for a considerable amount of care The veining, shaping, and turning, involving a variety of cuts, while not intricate, call for a considerable amount of care and skill with the hand tools. The chaise lounge especially demands careful calculation in the lay-out, as well as a trained hand at cane weaving and upholstering. There is also a sufficiency of glued-up work to prove what a student can do with a joint, and enough curved work to demonstrate his ability with the band saw and curve working tools.

In the construction of these projects there were various sources of influence affecting the design and style of the several pieces. Furniture advertisements in the newspapers and magazines, furniture catalogs, and furniture in the local stores were all used to help formulate the plans of the pupil. From these the student made freehand sketches, worked out the proportion and balance, then added the main over all dimensions. From this stage of development the pupil proceeded to make the true scale mechanical drawing, the detailed drawings, and finally the



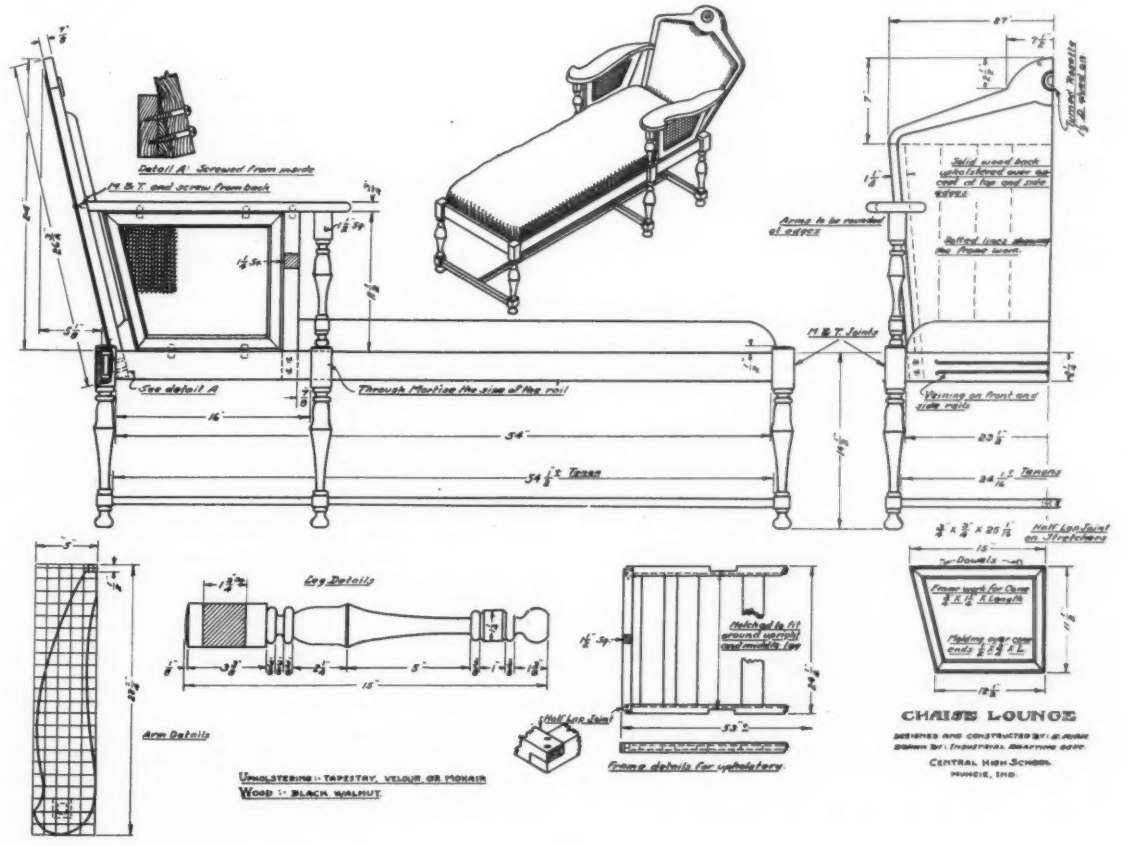
DETAILS OF UMBRELLA HOLDER (See Page 144).


LEGS TO BE ⅞" THICK
DETAIL OF STEM
STEM TO BE DIVIDED IN THREE EQUAL PARTS AND MORTISED FOR THE THREE LEGS.
M & T JOINTS
DOOR HINGED AT BOTTOM AND OPENS DOWN OR CAN BE REPLACED BY DRAWER
EDGE OF SHELF ROUNDED OFF

ROUND TOP TABLE & STAND

MADE AND BUILT BY :– E. KIRK.
DRAWN AND TRACED BY :– F. CONDON
CENTRAL HIGH SCHOOL
MUNCIE, IND.

MATERIAL :– WALNUT OR MAHOGANY


Detail A. Screwed from inside
M. & T. and screw from back
See detail A
Through Mortise the size of the rail
Arms to be rounded at edges
Solid wood back upholstered over top and side edges
Rolled back allowing the head room
M & T. Joints
Webbing on front and side rails
Front Pivots ½" in diameter
Tenons
Half Lap Joint on Stretchers
Dowels
Frame work for Cane ⅞ x 1½ x Length
Molding over Cane ends ⅞ x ⅞ x L.
Leg Details
Arm Details
Notched to fit around upright and muntin top
Half Lap Joint
Frame details for upholstery

UPHOLSTERING :– TAPESTRY, VELOUR OR MOHAIR
WOOD :– BLACK WALNUT

CHAIR LOUNGE

DESIGNED AND CONSTRUCTED BY :– E. KIRK
DRAWN BY :– INDUSTRIAL DRAFTING DEPT.
CENTRAL HIGH SCHOOL
MUNCIE, IND.

PRODUCTS OF THE AUTHOR'S CLASSES.

mechanical perspectives which fixed in the mind of the student the picture of the projects as they would appear when completed.

These drawings were then taken to the woodshop and the turned members worked out on the lathe. As soon as the turned work for the chaise longue was completed, the side and end rails, tie rails, and stretcher were cut out, all mortise and tenons cut on the machines and the parts sanded preparatory to assembly. The veining on the rails was laid out with the gauge and the routing done with the universal plane.

UMBRELLA HOLDER (See Page 242)

While the joints were drying, the arms and frames for the caning were made. These presented problems for careful calculations and angles. Splines were used at the corner joints. The frames were then fastened in place, the caning being done after the finish was applied. The arms were moulded by hand with the use of the spoke shave, plane, chisel and file. Accurate patterns were laid out for these arms (and for the stand legs and other parts which had to be duplicated.) The arms were next fastened in place, after which the frame for the back was made and secured to the arms, legs and cane frames.

The work was all sanded and finished before the weaving and upholstery was begun. The springs for the upholstering rest on slats, either end of which rest on a strip glued and screwed flush with the lower inside edge of the side rails. Sea moss, curled hair, burlap and cotton were used in the upholstery, and the final covering was a good grade of tapestry.

While the various joints and finishes were drying, the turned members of the smaller projects were produced and as the joints of the tables were setting other projects were begun, thus eliminating a loss of time usually occasioned by gluing.

The umbrella stand is not a particularly difficult project for the skillful wood turning student, but presents a little unusual problem in chuck and face plate turning. The quadrant which retains the upper end of the umbrellas in place was turned from a complete circular piece glued up in segments, and was afterward cut into four equal parts, only one of which was used. To it were doweled the turned ornaments which fasten the whole to the vertical spindle by means of the two turned spokes or smaller spindles. All joints are turned tenons fitted into holes bored by hand. A template cut out of cardboard may be used in turning the six little spindles alike.

The tables present nothing new in the way of construction and we believe these are so clearly shown by the drawings and photographs as to need no further explanation.

The material used in all of this set of projects was American black walnut and the whole was finished in the natural color, using clear filler two coats of shellac, and four coats of varnish rubbed to a satin finish.

Printing in the Continuation Schools

Arnold Levitas, Instructor in Printing and Typography at the Bronx Continuation School, New York City.

THE continuation schools are spreading gradually. Today we have seven of them in the city of New York. Quite a number of the popular trades are being taught, and more are being introduced from time to time as the need develops, and it is expected that in time all the industries will be properly represented.

Among the trades taught, the subject of printing is gradually coming to the fore. Now there are only three classes; but it is hoped to have many more before long. This subject has been found to lend itself well for purposes of study, and instruction has been quite successful and result-bringing.

There are no textbooks as yet, and the teacher must prepare and develop his methods of teaching and courses of study as he goes along. Experimentation on these lines has brought out some interesting and effective results, and a course which is practical and comprehensive is now followed at the Bronx Continuation School, New York City.

This course is divided into two parts—Practical typesetting and printing (two hours,) and typographic design, proofreading, and estimating (two hours.) The practical work consists of composition, distribution, stone-work, press-work, use of stitcher and cutter. The academic work consists of English (proofreading, punctuation, capitalization, etc.,) mathematics (computation of space, cost-finding, estimating composition, paper, ink,) drawing (typographic design, lettering, planning layout,) talks on civics and hygiene.

The boys enter the class all through the term—new ones coming almost every day—so that their knowledge is variously graded; and it is necessary, therefore, for a good deal of individual instruction. This is accomplished by means of progressive lesson-sheets. The lessons are arranged to fit every stage of development, so that a boy coming at any time during the year will get the instruction taken up previously—partly through self-study.

When the student comes in for the first time, he receives a card that explains the type-case and how to acquire a knowledge of it—that is, a knowledge of the location of the various letters, the lower-case and upper-case. The student is directed to set up a line of type of each letter and character in the case. By this he learns three things—namely, how to hold the stick and set type; the location of the letters; and how these letters appear upside down.

After the boy has learned the case, he receives another card, where he finds an explanation of the system of spacing. With the help of this card, he learns to recognize the spaces and their location.

When he has acquired a knowledge of the case and spacing, he gets a third card, which gives him information in drawing a diagram of the case. This diagram must be submitted by every student before he gets his first job to set.

Job No. 1—as the first job is called—consists of six lines. The first line is of single letters; the second, third, and fourth lines are of simple words, spaced; and the fifth and sixth lines are of easy reading matter. The student finds full directions and explanation how to proceed with his job on the card; and, if he is possessed of ordinary intelligence, he should find no difficulty in setting it.

When the job is set, the instructor lifts it out of the stick and shows the pupil how to tie it up. The pupil receives a card explaining how to take a proof on the proof-press, and this is also demonstrated to him for his first job. After he has taken a proof, he is told to read the proof and mark the corrections—which knowledge he previously acquired in the academic class.

The instructor looks over the proof; and, when the corrections are all properly marked, the student receives a card explaining how to make the corrections in type. The instructor, however, helps the student in correcting his first job, and gives him a practical demonstration of it.

When the job is corrected, proved up again, and found clear of errors, the student is directed to distribute it, and he receives another card explaining how that is to be done.

A similar procedure is had with Job No. 2. Here the student needs less of the attention of the instructor, although the job is a little harder than the first one. In proper order follow Job No. 3, up to No. 20—each one a little harder than the preceding one. With each succeeding job the student gets a little more facility—requiring less of the attention of the instructor.

After the student has finished Job No. 2, he is given an opportunity to learn some of the other phases of the trade—such as stone-work, press-work, etc. For this purpose, a chart is provided for every class, showing each student's name and his particular work for that week. This chart is arranged to cover one term of twenty weeks, and each student gets eight weeks of case, four weeks of presswork, two weeks of stone-work, two weeks of proofreading and correcting, and two weeks of distribution. This plan is considered to be a fair division of the work and each student gets an equal chance of learning every phase of the trade.

When a student remains in the class for another term, he is usually put in charge of some department—preferably on work for which he has shown special aptitude. In that department he is in the position to learn more of the work for which he is best fitted. At the same time he helps the instructor with the new boys, who constantly come in and go through the various departments in the class.

In the Bronx Continuation School, there are five classes in printing—one class for each day of the week. A different set of students come each day, and they are given four hours of instruction—two hours of practical work and two hours of academic work. This is all that is possible to do for them under the circumstances, since they are all engaged in work for a living and their employers cannot be expected to allow them any more time.

Each class in printing has a foreman, who is selected from among those with most experience and ability. There is also a sub-foreman in charge of each department—stone, press, composing-room, proof-room. The foreman and sub-foreman are responsible for the equipment and supplies in each department. They help the instructor in their care and in instructing the new boys in their tasks and duties.

In the academic class, the instruction is more general than individual. In the proofreading period, the first lesson consists of learning the proofreader's marks—which are put on the board and explained. The students copy the marks in their note-books for future reference.

The first work in proofreading consists of a galley-proof. Each student gets a proof of the same galley, and he is asked to read it over, find the mistakes, and mark them as he is instructed. Then the teacher reads the same galley together with the class, and demonstrates the marking of the errors on the board—so that all students may copy and learn how to read proof correctly.

In the study of punctuation, the instructor writes the rules on the board, which the students copy. These rules are illustrated and thoroughly explained—until students understand them thoroughly. The same is done with capitalization, division of words, etc.

In computation of space, cost-finding, and estimating, students are given practical examples to work out, after the methods have been thoroughly explained to them. After each example has been worked by the students, the

instructor takes it up with the whole class, so that errors may be corrected.

In the work in typography—design and layout—students are given instruction in lettering. After they have mastered that phase of the work, they are taught how to construct a business-card, letterhead, etc., from manuscript copy. Each example of commercial work is demonstrated on the board, and each student submits a sample of each specimen of his work, to be criticised and corrected. After the students have acquired a good knowledge of design, they are given the construction of advertisements. As far as possible, the work designed in the academic room is later set up in the composing-room, and the students have an opportunity to see the result of their efforts.

Talks on hygiene include the matter of cleanliness, exercise, food, drink, alcohol, tobacco, the workroom, outings, occupations, dangers, accidents, poisons, first aid, seasonal hygiene, and disease.

Talks on civics include the history, development, and modern tendencies of the printing industry, municipal, state, and national government, citizen's duties, American ideals, etc.

Special emphasis is laid on the matter of the boys' appearance, their conduct in the class, careful handling of tools and equipment. They are trained to be neat in their work and their habits.

From time to time requests come from employers for the services of boys, and the best of them—those who have measured up—are recommended for positions, where in many cases fine opportunities await them.

There is, of course, still a great deal of room for improvement; but it is encouraging to note that persistent effort, perseverance, and a thorough study of conditions are bringing the continuation school idea to its goal.

Job No. 1.

The composing Stick is held in the left hand, and the type is set therein. Keep your thumb next to the type you are setting. Set your type with the nicks up.

Set the clamp to measure 18 picas, and follow the copy closely.

Set one full line of "e". No space between letters.

Set one full line of "he". Use 3-em space after each "he".

Set one full line of "the". Use 3-em space after each "the".

Set full lines of each of these, as shown. Use 3-em space after each word

eeee

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

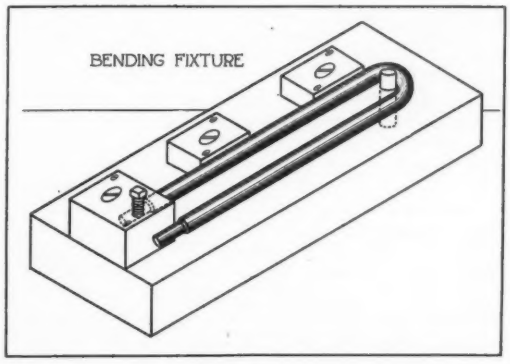
Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

MONKEY WRENCH.

Herbert D. Harper, New York, N. Y.

The monkey wrench is a good first year machine shop problem, combining both bench and lathe work. For the frame a piece of cold rolled steel, 5/16" diameter and 13-5/8" long, is needed. This allows for bending and finishing the ends. There are two methods that can be used for finishing the ends and turning them to ¼" diameter.



DETAILS OF BENDING FIXTURE.

First Method: Cut the threads with a 5/16"-18 die; heat the rod in the center and bend over a piece of ⅜" stock held in a vise. Then holding the bent rod in a double V-block fixture, machine the ends with a hollow mill to the required size.

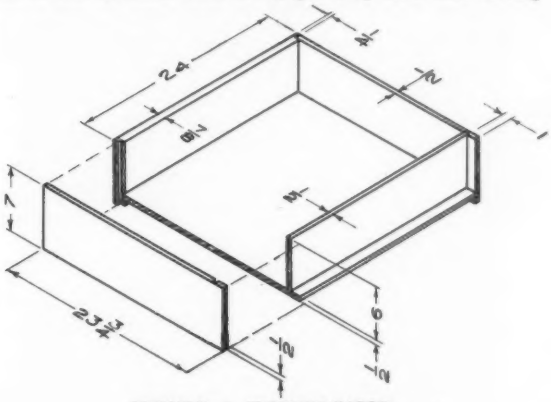
Second Method: Holding the roll in a universal three jaw chuck face both ends so that the roll measures 13½". Then turn both ends to ¼" diameter. After cutting the threads with a 5/16"-18 die, heat the rod in the center and using the bending fixture, bend to shape.

The jaws are made from ½" square cold-rolled steel which can be case-hardened after machine work is done.

KITCHEN TABLE.

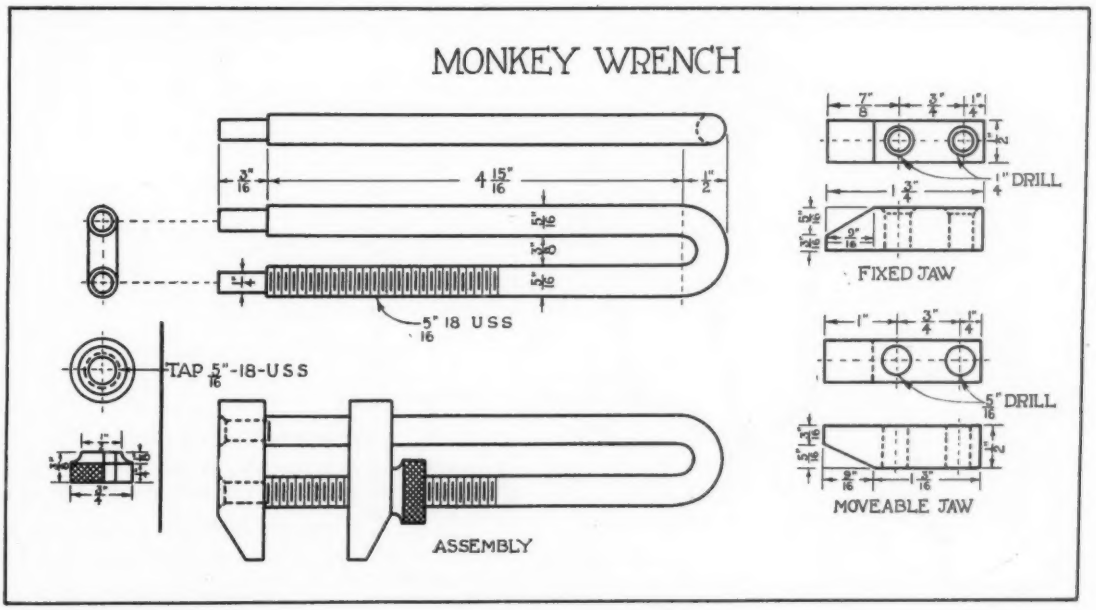
Charles W. Frost, St. Paul Minn.

The kitchen table is shown with paneled ends and back, (the panels in the latter being of plaster board), but it can be made with solid, glued-up ends and ceiling board back. The latter can be omitted entirely and the ends scribed to the wall of the room, if preferred.

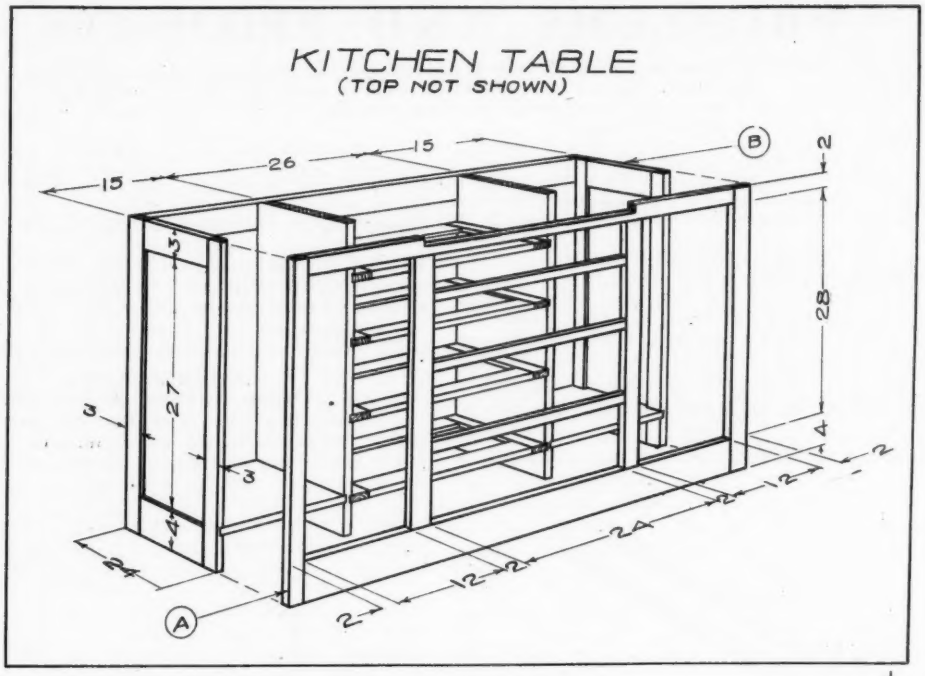


DETAILS—A, KITCHEN TABLE.

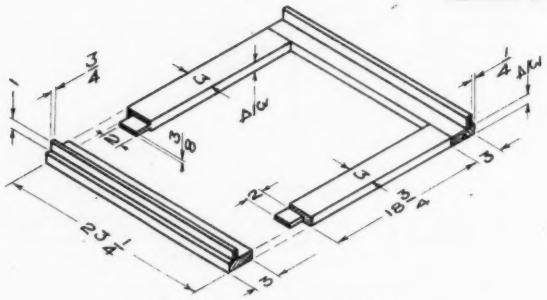
The top is not shown, but should be made of 1⅛" spruce, if this can be obtained, glued up with water-proof glue, and kerfed on the under side to minimize warping.



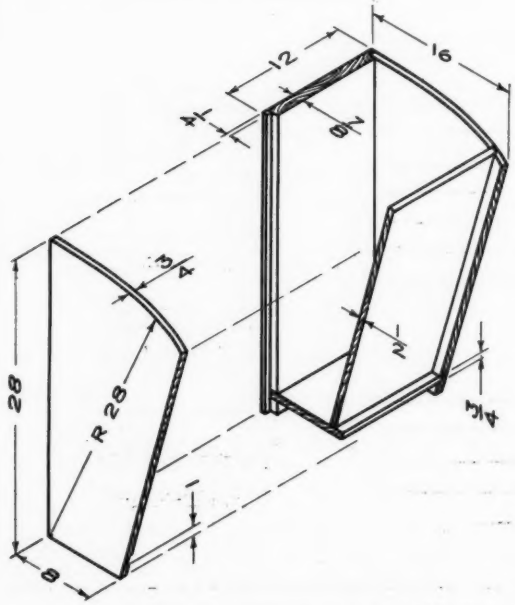
DETAILS OF MONKEY WRENCH.



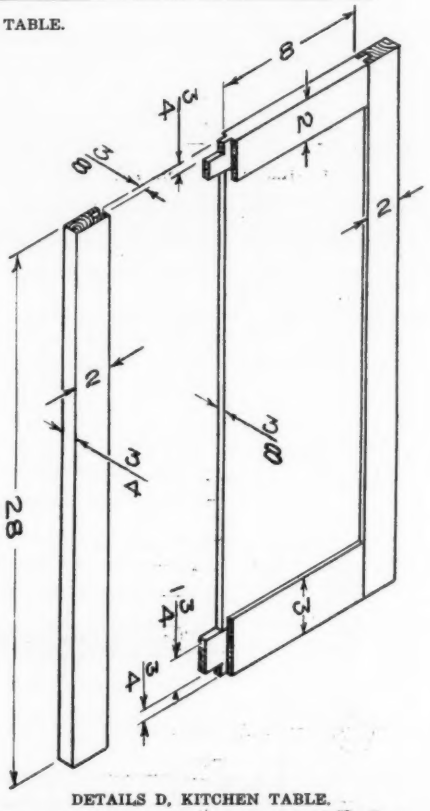
DETAILS OF KITCHEN TABLE.



DETAILS B, KITCHEN TABLE.



DETAILS C, KITCHEN TABLE.



DETAILS D, KITCHEN TABLE.

It should project 2, or 2½" at the ends and front to provide a ledge upon which to clamp a food grinder, or knife sharpener.

The flour bin, (details "C") may be placed in either the right or left compartment of the cabinet. It is hinged to the top edge of the lower rail.

The compartment not occupied by the flour bin is utilized as a cupboard. The door shown in details "D" should be hinged to the end style of the front frame.

The ends of the cabinet are built exactly the same as the door but with the different dimensions shown for the various parts in Figure 1.

The drawers may be made any depth prefered, the construction being identical with that shown in details "A", but with the front, back and side pieces wider or narrower as required.

Names of Parts of Kitchen Table.
(Figure 1)

A—Front frame.
B—Cabinet.
Details A—Drawer Construction.
Details B—Drawer runner and guide frame.
Details C—Flour bin Construction.
Details D—Door Construction.

CONVENIENT SHEET METAL WORK BENCH.

Frederick W. Voss, Director, Watertown, Wis.

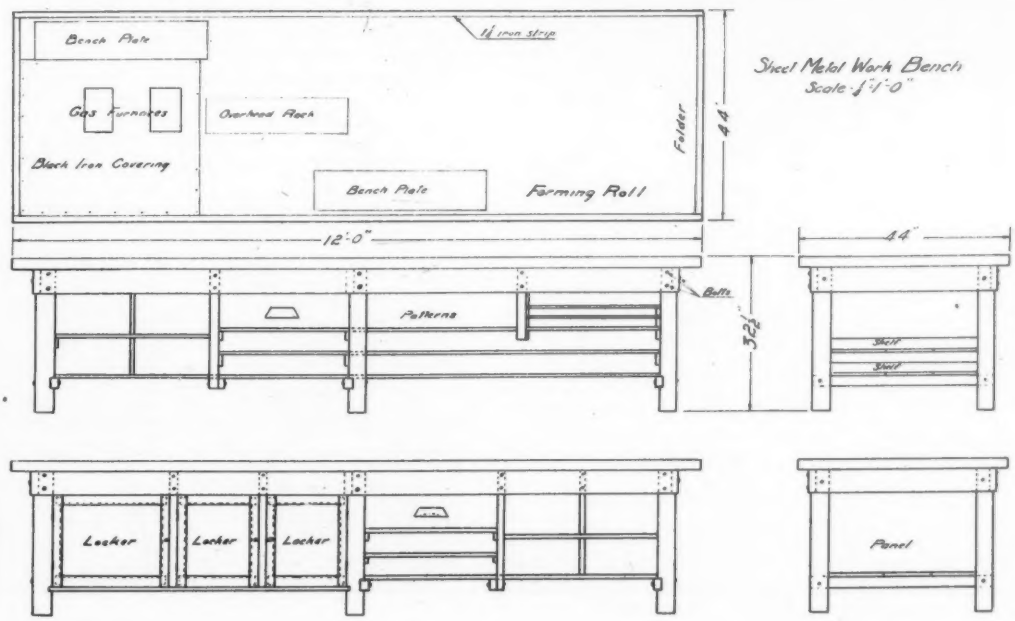
The sheet metal work bench shown in the accompanying illustrations was made in the school shops for use in the sheet metal working department of the Watertown Vocational School. The limited amount of room available forced the author to plan a bench which would be best suited to take care of the sheet metal work in the school.

Figure 1 shows the end of the bench, used for soldering, which is covered with black iron. The space at the end below the top is used for hanging machine wrenches, mallets, etc. At this end of the bench are constructed eight pigeon holes in which the students may keep their unfinished work. These compartments run as far back as the center of the bench.

Figure 2 shows the stock end of the bench which shows how the shelves can be arranged to suit one's needs for storing the various kinds of tin plate and galvanized iron. The shelves for the galvanized iron are 31 inches wide by 96 inches long, which will take the standard sheet of galvanized iron 30 inches by 96 inches. Three hanging shelves shown at the far end in Figure 1 are used for various tin plate stock.

Figures 2 and 3 show the front of the bench which has three lockers constructed 3½ inches deep for keeping the smaller tools and machine rolls. The large drawers can be used for keeping stock solder, sal ammoniac, rosin, rivets, etc.

The overhead rack fastened to the top of the bench permits the placing of the smaller machines out of the way in the most convenient place, thus permitting the



use of most of the bench surface when desired. There is ample shelf room under the bench for keeping the students' patterns.

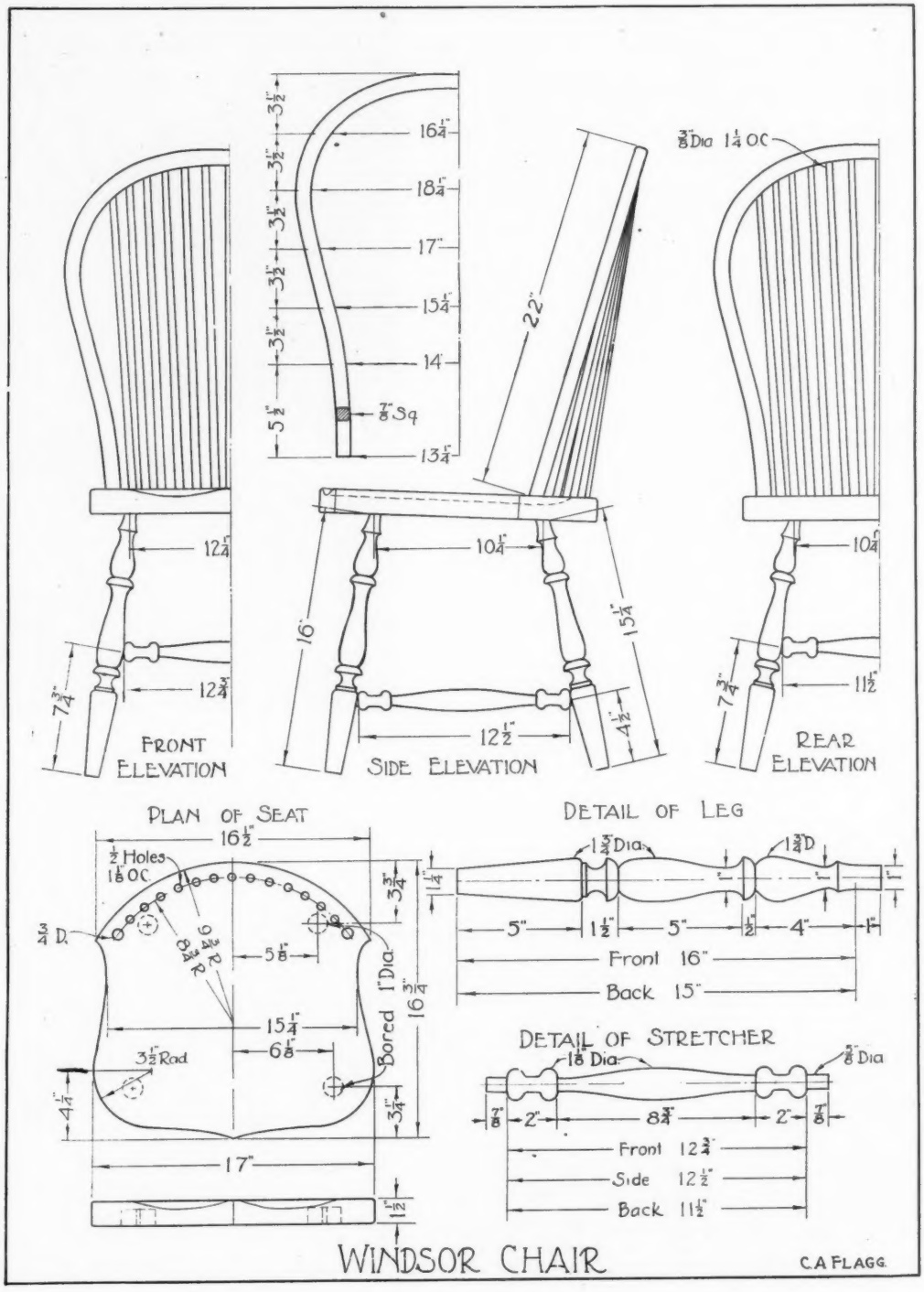
The ends and edges of the top have a ¼" strip of iron fastened flush with the surface of the bench which prevents rounding off of the edge. This type of bench will be found very satisfactory in any school sheet metal department, especially where a minimum amount of space is available.

THE CONSTRUCTION OF A WINDSOR CHAIR.

H. J. Wieland, Virginia, Minn.

Among the many pieces of furniture adapted from the early American or colonial types, one of the most popular is the Windsor chair.

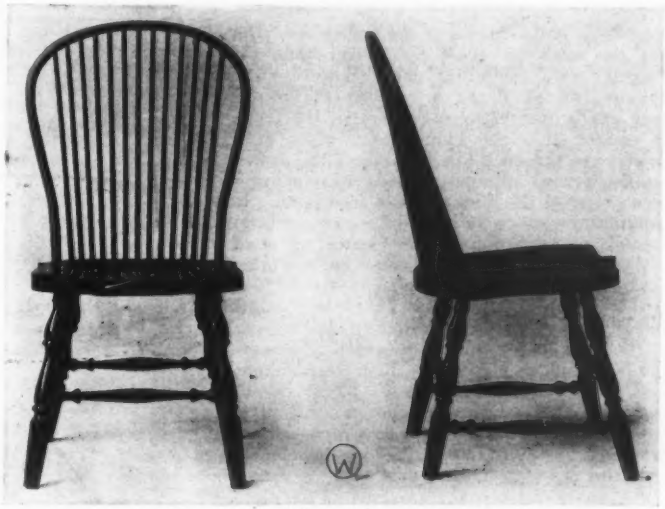
The name Windsor embraces several different forms of chairs, which are distinquished by turned legs, stretchers and spindles and curved or bow-shaped backs. They were all originally created from the design of the Windsor



chairs brought to this country from England by the early colonial settlers.

The chair described here has been found well adapted to a school course in furniture construction, where wood-turning facilities are part of the equipment. Besides filling the need for a project to take the part played by the heavy oak mission style of furniture which is being replaced by lighter and more artistic types, it should be an influence in developing for the student an appreciation of the finer sort of furniture. It also furnishes him with a new experience in laying out, bending and assembling which is not encountered in many other pieces.

The finer cabinet woods such as mahogany or walnut work up best in this project, but if not available good results may be obtained with birch, gum or even poplar. A finish appropriate to the wood should be used, which may be one of the mahogany shades, walnut, or a painted finish in a suitable combination of colors. The latter type of finish is more suitable where a number of pieces are to be made to match, the same color scheme being used on all.



FRONT AND SIDE VIEW OF WINDSOR CHAIR.

Instructions for Building a Windsor Chair.

In order to build this chair, it will be necessary to make a full sized drawing. This will give the exact shape of the back, the proper angle for boring the holes for the legs, and stretchers, as well as the depth of holes for the legs in the under part of the seat.

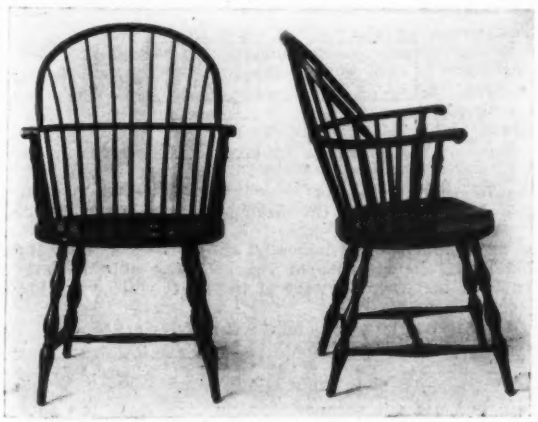
The shape of the legs can be changed to suit, although most of the Windsor chairs have the tulip design turned legs. A rush seat can be used instead of the saddle seat. The edges of the back can be run on a shaper if there is one in the shop. The triple bead is usually used for moulding.

Following, is the order in which the chair should be constructed:

1. Glue up the seat in a number of pieces about five being sufficient to keep it from warping. The grain should be alternated in each joint. Use a butt joint as dowels would show after shaping the saddle.

2. Lay out the shape of the back on a sheet of paper and glue up enough 2" stock to make a form for the same. Before sawing same, to shape, gauge off ¼" from line. After sawing, bend a strip of ⅛"x3½" iron around same and fasten with screws. This makes a good form and will make a good edge to clamp the hand screws to; and also the glue will not stick to metal. The form described will do a few hundred bendings.

3. Select a good piece of straight grained birch for the back. Steam this long enough so that it will bend without cracking. Test a few times before placing in the form so that everything will go along well when bending same to shape in the form. After all clamps are tight, set away in a dry kiln or some good hot place so as to dry out all of the moisture. This is very important as the back will spread out if it is not dry. If no steam box is available for bending, a good back can be made by taking eight pieces of birch or poplar ⅛" thick by 1-⅛" wide and of the proper length and gluing these with hot glue and clamping them in the form. This kind of a back requires about 18 or 20 hours for drying. Care should be taken to get all edges even and in line with the top edge of the iron so as not to get it twisted. Chair backs of the above described shape can also be purchased from Shepard and Son of New Haven, Conn.



A WINDSOR CHAIR WITH SIDE ARMS

4. Turn the two front legs and two rear legs to shape. The dowel which fits into the seat should be a good tight fit. Mark centers for stretchers very lightly with a pencil while the stock is revolving in the lathe.

5. Turn front, back and side stretcher to shape. The dowel of the stretcher should be long enough to go half way into the leg.

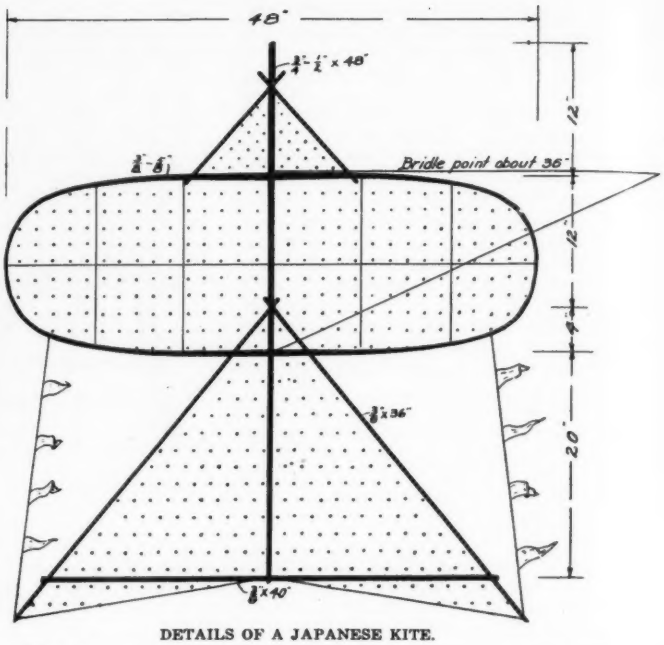
6. Lay out a pattern for the outside shape of the seat. On this pattern, lay out the centers for the legs, the back dowels and the spindles as well as the outline of the saddle shape. Transfer shape and all dowel centers to seat stock.

7. Saw the seat to shape and bore the holes for the legs. Insert the legs and bore stretcher dowel hole with a brace held between the legs so as to get the proper angle for the holes. After about eight turns of the brace, the leg can be swung out a little so as to get a clear swing with the brace. Repeat on the other three stretchers. If all the dowels are turned to a good tight fit, it will be necessary to remove the legs of the seat to set the stretchers in place, and then work all four legs into the bottom of the seat at one time. All holes can be bored before the legs are turned if this method is more suitable.

8. Plane or spoke shave, the back to shape and measure off the proper length of the dowels. Work dowel to eight sides with a rasp. Bore a hole the size of the dowel in a piece of ¼" iron. Work this piece of iron around the dowel to shape it round. This piece of iron is forced over the stock in the same way as shaping a dowel by driving a piece of wood through a dowel plate.

9. Bore holes in seat to receive back dowels. Set back down good and tight and lay out centers for back spindles. Top and bottom holes for back spindles must all be bored while back is set in place as every spindle is at a different angle. Bottom dowels are ½" diameter, top dowels ⅜" diameter. Bottom dowels ¾" long, top

dowels ½" long. The back spindles are in lengths in pairs excepting the center one. Get out the stock for these ½" longer than the longest one, including both dowels. The spindle can be round or square. If round, they are turned between centers in the lathe. If square, they are planed to a taper after dowels are turned. The turning of the dowels on the square spindles is done by placing a piece of stock 1" thick on to a face plate. In this plate, work out a hole ½" square or large enough to take the stock. Center up stock and place one end into the plate and the other against the cup center. Turn the bottom dowel first on each spindle. Place the spindles in the hole in the seat and have the top end on the top center line of the back and mark the length of each spindle. Remove same and add the length of the dowel. Place spindle back in lathe and turn top dowel. After top and bottom dowels are turned on each spindle, taper off to size of dowel, ½" square on bottom and ⅜" square on top.



DETAILS OF A JAPANESE KITE.

A PHILIPPINE ISLAND BIRD KITE.

E. M. Wyatt, Dallas, Texas.

This is a design made from a kite, flown at a Texas kite tournament last year, by a boy from the Philippine Islands. It stood out from a thousand kites as the finest kite flown by almost every point of comparison.

The framework is of bamboo. An ordinary fishpole split with a knife is the proper material. The spine is ¾" wide at the top and ½" at the bottom. It is permitted to project above the sail surface for fighting purposes and as a protection to the wings should the kite dive to the ground. The two pieces forming the wings taper toward the ends. They are twisted a quarter turn near the splicing points which are at the extreme sides of the kite and not at the spine. At the spine these wing pieces are lashed flat to the spine. This is arranged so that in a breeze the wings will bend backward and present a breast to the wind.

A two-line bridle is used, with both lines attached to the spine. When the bridle is pulled to one side as shown in the drawing, the angles these lines make with the spine, should be approximately those indicated in the drawing. No tail is required.

The frame should be covered with a tough rice paper. Unglazed tracing paper does very well for this purpose, but a more striking appearing kite will result of two or three colors of paper are used. In the kite from which this drawing was made, the triangular sail area at the top was covered with heavy felt cloth. This was done to weight the head a little making it dive better.

MECHANICAL DRAWING STANDARDS FOR HIGH SCHOOLS—A DISCUSSION.

Herbert D. Harper, Murray Hill Vocational School, New York, N. Y.

In reading the report of the special committee on Mechanical Drawing Standards for High Schools, it would seem that an excellent opportunity was lost when they did not suggest the standardization of some of the common conventions used in drafting. As several standard authors do not agree, the need of standardization is self-evident and as the object of drawing is to bring a picture to the workman of an idea or conception by the designer, that drawing is best that does it with the fewest possible lines. This is not being done in a great many instances as the following examples of conflicting methods show.

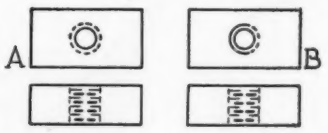
First, conventional method of showing threads. The standard way of teaching threads is to show the construction of a helix curve, its application to the screw thread shown, and then the conventional method as shown below at A.

If there are 10 threads per inch, there must be 10 on the drawing and the threads drawn at an angle corresponding to the helix angle. To draw the threads at an angle is not as easy or as quick as to draw them straight as shown in B. And why should the number of threads on the drawing correspond to the pitch of the thread, when the pitch and kind of thread are designated? There is also conflict in dealing with the top views of internal threads as shown below.

Some schools teach that A with a full broken line for the outside circumference is correct and some B with a broken line only half the circumference, and some firms do not use either, simply designating whether the hole is drilled, reamed, or tapped.

Second. Then the question that has provoked considerable discussion in trade journals this past year: "How shall we designate tolerances and should limits be placed on all dimensions?"

Those who have worked from drawings know the time wasted due to insufficient or inaccurate dimensions. Some draftsmen do not seem to know what tolerances are or what they should be for the job they are doing. They sometimes give dimensions in thousandths of an inch when tenths or hundredths are close enough. There are conflicting methods of designating tolerances in different shops; for instance, in considering a standard hole of 1.250", by the accepted and almost universal method, this



measurement is given as
1.250—0.000 inches and the mating shaft 1.248+0.000 inch.
+0.002 —0.002
The basic dimension is indicated and nothing smaller than 1.250 inches in the case of the hole and nothing larger than 1.248 inches in the case of the shaft will be accepted. Other methods used are:

1.251+0.001 inches and 1.247+0.001 inches and

$$\frac{1.252}{1.250} \text{ or } \frac{1.248}{1.246}$$

These last are not so good, for, as experience has shown the majority of workmen endeavor to work to a dimension that they can see plainly, it seems desirable that

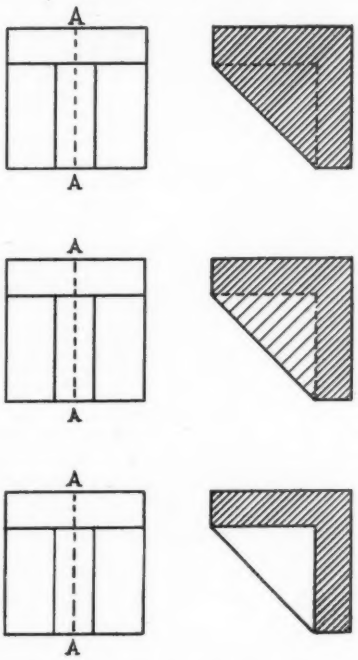
the basic dimension be shown. And as tolerance is simply an indication of the variation from a certain size that is of service in an assembled unit, it would seem that a one-way tolerance should be preferred. In one-way tolerances the hole or similar surface is basic plus the given tolerance and all plugs or similar mating surfaces made basic minus the tolerance, or using the figures above we have: 1.250+0.002 inches and 1.248—0.002 inches. This method shows the workman what is wanted without the least chance of confusion and error.

Likewise something might be done about cross section lines. Already some firms have abandoned "Standard Cross Sections," preferring one style hatch line, the representation of cast iron for all metals, for it is much quicker to print the name of the metal than to draw some of the conventional cross sections.

While on the subject of cross sections, what is the best method to show sections through ribs? The theoretically correct way is shown below, the hatch lines being drawn through the entire figure.

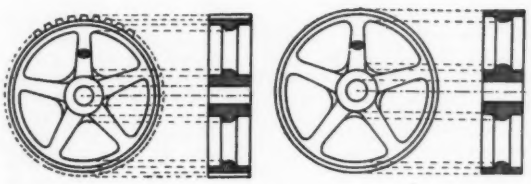
But some authors do not like this and prefer drawing every second line through the rib as shown below.

While this method is quicker than No. 1 and answers the purpose just as well, some firms go one better and draw hatch lines only through the plate, just as if the line on which the section is taken is not through the rib. Other firms have it understood that no section lines are to be drawn through ribs as shown below.



Certainly in drawing it this way no more theory is wrecked than when drawing a five-arm pulley, or gear blank and not to section the upper arm as seen below.

There are other conflicts that might be thrashed out, but I will leave some for other drawing teachers from whom we no doubt shall hear. But in this discussion of standardization, there should be no room for pet theories and fancies and the methods chosen should be clear, simple, and time savers. They should conform to the best shop and drafting-room practice and make for economy.



ANNUAL BANQUET—SCHOOL CRAFTS CLUB OF NEW YORK CITY.

Members of the School Crafts Club, New York City, enjoyed a royal good time at their annual banquet held on Saturday evening, April 28, at La Maisonnette, on West 45th Street. The reason for this was included in a fine beef-steak dinner, much singing, and top-notch speakers. Mr. Otto C. Schantz, a club member, led the group songs between the courses beside rendering several solos. Mr. Schantz has a fine baritone voice. The members received a shower of tokens presented by well known firms dealing with materials related to the teaching of the manual arts.

Dr. David Snedden, of Teachers College, Columbia University, spoke upon "Changes in the Public School Curriculum." Twenty years ago the public school system of the United States reached a condition of national maturity. It had passed the stage where compulsory education was any longer an issue. Teaching had become a profession. Now he predicts an era of curriculum reconstruction. The matter in question more than ever before is, what do schools stand for? There has come about a great deal of specialization in teaching, and each type wants so much time devoted to it in the curriculum that there is not time enough to go around.

Educational authorities have great strides in understanding the different potentialities of learners. Subjects which are adapted to some are not good for others. Some subjects have great merit for the few. The new keynote in education is that some things should be taught thoroughly while others may be stressed less. Educators must be able to differentiate. Some subjects rely on interest while others must be taught exactingly, whether interest can be aroused or not. The problems in variability which confront us are intelligence of children, social inheritance, and native capacity.

The aims and purposes of subjects are not always clearly defined. This problem is being threshed out in the junior high school area, where all types are represented. Authorities disagree as to how uniform the courses that are given should be. Some feel the need for much more diversity than others. For instance, should all take a foreign language, or would the time be better spent on another subject or other subjects.

We are just passing out of an era of uncertainty in the industrial arts field. The old claim of manual training for formal discipline, that hand training paralled the training of the mind, had to give way. During the period of 1913-1915 occurred the pushing of vocational education. Laymen were confused at this time, for they had believed that manual training fulfilled this demand.

By themselves the specialists of the different fields of education do not have a sufficiently wide horizon to organize their work in such a manner that it will mesh in with other subjects in the reorganization of the curriculum. An impartial organizer must work with them. There is to be a course in the summer school of Teachers College this year, in which the purpose is to thresh out the subject of industrial arts in the curriculum. The work is to be of a cooperative nature, for committees are to be appointed to work out details and Dr. Snedden will act as the organizer.

Mr. Alexander J. Glennie, principal of the Miller St. school, and supervisor of evening schools, Newark, N. J., gave a summary of some 53 bills affecting education, which were brought before the New Jersey legislature. Thirteen of these were passed. He stressed the fact that all subjects must strive to vindicate themselves. Teachers are always given a careful hearing at the legislature when united in a body.—**Lloyd F. Stair.**

Mr. Harry E. Wood, director of vocational education and manual training at Indianapolis, Ind., has accepted a place on the summer school faculty of the Peabody College for Teachers, at Nashville, Tenn. In addition to courses in industrial arts, Mr. Wood will also have charge of a course in drawing and design in the department of fine arts.

Mr. Geo. Henry Jensen, formerly professor of industrial education at the University of Washington, has recently become Personnel and Employment Director of the Wheeler-Osgood Company at Tacoma, Wash. In his new work, Mr. Jensen is in charge of all employment and personnel matters and conducts the foremanship training work for the various mills operated by the Wheeler-Osgood interests.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

A Paste Filler.

355. Q: Will you please give me a recipe for making a good paste filler suitable for use in the woodworking department of our high school?— K. K. K.

A: The most practical formula which I have yet found for making paste filler stock is one published by Walter K. Schmidt.

12 parts boiled linseed oil.
6 parts dark japan drier
1 part turpentine.

To this amount of liquid add all the finely ground silex which it will absorb to make a very stiff putty or dough. Let stand over night in a covered can and it is then ready to be reduced as needed. For a reducer I find that one part turpentine and two parts benzine give very fine results. Tinting colors, of course, may be the usual ground in oil grades used by painters in tinting house paints.—Ralph G. Waring.

Finishing Basswood.

356. Q: We have some pieces of furniture made of basswood. Could you give us the best of finishing in walnut? Would like to get a good rubbed finish on it if possible.—J. R. S.

I have found that a very pleasing and durable finish for basswood can be secured by the following method. It is both desirable and practical, that all edges be sanded round at least $\frac{1}{8}$". This will in no way detract from the squareness of the finish but at the same time will prevent any edges wearing white in the future. This is a point which is often neglected in preparing furniture for the finish. The wood should be sponged with hot water to raise the grain and lift any bruises incurred during the process of assembly. When dry the piece should be sanded clean and smooth. Prepare a four ounce solution of Universal Brown Water Stain by adding four ounces of dry powder to one gallon of boiling water, giving plenty of time to have the material in solution. Brush this on freely while still hot and let dry. Then sand with a split 6-0 paper. Reduce some of the stock stain one-half with boiling water and apply a second coat which should be dried 24 hours or more without sanding in order that full color tones may develop. At this point, one of two methods may be followed. The shorter calls for the use of a diluted solution of orange shellac applied as a sizing coat only and when dry sanded glass smooth with split 6-0 paper. The other method which produces a somewhat deeper and richer tone, perfectly matching black walnut, is secured by using one part boiled linseed oil and one part turpentine applied evenly and somewhat sparingly as a hot brush coat. This should be allowed three days to dry and any traces of oil remaining on the surface should be removed with a cloth. The size coat of orange shellac should then follow and when dry should be sanded with split 6-0 paper. The piece should be well dusted and removed to a warm, dust free room and given a well brushed out coat of some high grade varnish. When dry, sand with a split paper until free from gloss and nibs, dusted off and revarnished. The second coat should dry at least one week and should then be carefully rubbed with FF pumice stone, felt pad and water and cleaned with a good polish.—Ralph G. Waring.

Removing White Spots.

358. Q: A dining room table which we have in the school here was marred recently by having hot dishes set on it. It is a circassian walnut job, and I think it is a fumed finish. The heat caused white spots to appear and we can find nothing to correct it.—I. M. C.

A: If conditions are as represented, we have a very unusual circumstance of "circassian walnut with a fumed finish." It is most usual to employ a light bodied rubbing varnish on circassian walnut and rub the last coat dull. On a fumed finish the trade usually demands tinted shellac and a wax finish. Within the last year or two, a larger number of manufacturers are spraying on shellac finishes because of the speed with which they can turn out a finish acceptable to the average buyer, who is without any practical knowledge concerning the durability of the different types of finishes. It is my belief that this condition applies to this table, although there are a large number of cheap varnishes which will turn white under moisture and heat. The only practical suggestion calls for the refinishing of the top by removing the present coating with varnish remover, washing up with denatured alcohol, drying and revarnishing for at least two coats of some varnish like Pratt & Lambert's No. 61, allowing a week or more at 75°F. for drying between coats. The last coat should be rubbed dull and cleaned up before using. This will produce a water-proof and in most instances heat-proof finish.

It may be possible to remove the white spots by taking a soft brush and brushing on clear denatured alcohol, avoiding any tendency to brush back and forth. It is desired merely to thoroughly dampen the spots with alcohol in which case the latter will redissolve the undercoating provided it is the shellac type. Should it prove to be a wax and shellac finish, a slight amount of benzine or liquid wax applied to the spot with a flannel cloth which has been heated by holding against a hot flat iron may also do the trick. These are merely tentative suggestions since it is far more practical to put on a satisfactory and durable finish.—Ralph G. Waring.

Drawing Tests.

364. Q: I should like to know whether there are any standard tests for drawing, like those given for reading and arithmetic.—C. L. G.

A: **Rugg's Scale for Measuring Freehand Lettering.** (secondary schools.) Journal of Educational Psychology, Vol. VI, Jan. 1915; **Kline and Carey's Measuring Scale for Freehand Drawing,** $2, Johns Hopkins Press, Baltimore, Md.; **Thorndike's Scale for Grades Five to Eight,** Teachers College, Columbia University, New York, N. Y.; **Whitford's Art Tests.** (for all grades.) Prang Co., 1922 Calumet Ave., Chicago.

Walnut Finish.

342. Q: Will you please suggest a method for producing the Italian finish on walnut?—L. A. P.

A: The Italian finish which you mention has been generally applied to oak but lately is finding its way into the walnut trade as well. The Waring-Bowerman No. 200 stain when used at the rate of four ounces per gallon of hot water successfully reproduces the Grand Rapids Standard shade of deep rich brown which forms the base of the finish. A complete outline of the treatment would be as follows:

First, sponge the work quickly and evenly with hot water and a fiber brush. Owing to the heat the water penetrates the wood but a very little and thereby dries quickly without causing any disturbance of glue joints. Let dry and sand clean with a 4-0 paper. Apply a coat of Universal Brown water stain at the rate of 4 ounces is completely dissolved. When the stain coat has thoroughper gallon of boiling water making sure that the material ly dried and without sanding apply a coat of pure white shellac running not more than two quarts of gum to a gallon of alcohol. When dry sand glass smooth with a split 6-0 paper, dust off and apply a coat of white wax such as Butcher's Cold English Floor Wax.

When the wax has completely hardened burnish with the nap of a new piece of Body-Brussels carpet or stiff black bristle shoe polishing brush. Stand aside for an hour after which sift over the work dry powdered rotten stone enclosed in a single thickness of cheese cloth. With a dry 4" wall brush dust the powdered pumice stone carefully into the pores of the wood, remove the excess with a flat duster and carefully wipe clean and to a bright polish with the Brussels carpet pad and finally with a piece of clean cheese cloth. The effect of course can be further varied with a second coat of wax.—Ralph G. Waring.

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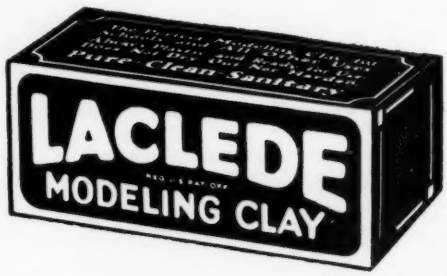

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Automotive Manual.

By A. L. Taylor and A. H. Blake. Fabrikoid cover, octavo, 178 pages. The Macmillan Co., New York.

This book presents a series of 36 carefully arranged exercises in automotive shopwork for secondary schools. Each exercise is preceded by a description of the principles involved in the mechanism and the most widely accepted types now in use. The directions for the exercise follow and questions, intended to clarify the student's thinking and verify his findings are appended.

The book emphasizes principles and ordinary care of machines but does not strongly teach trouble shooting.

Measuring Scale for Freehand Drawing.

Dr. L. W. Kline and Gertrude L. Carey. Revised. Fifteen pages and charts. Price, 60 cents. Johns Hopkins Press, Baltimore.

In this pamphlet the technical description of the experiments and processes used in developing the scale have been omitted. The scale has been improved by translating the scale values from arbitary numbers to percentages and by arranging the drawings in a more convenient form for classroom use.

Automobile Laboratory Manual.

By Frederick F. Good. Cloth, 12mo, 186 pages. $1.50. McGraw-Hill Book Co., New York, N. Y.

This book outlines a series of carefully graded project studies in the principles, construction, operation, adjustment and repair of the principal mechanisms of the gasoline automobile. Each project is so presented that the student has a clear idea of the operations to be undertaken, of the principles to be studied and of the results which are to be attained. Standard apparatus taken from standard cars is required. The book is arranged on a special plan so that the student gets first a knowledge of fundamental principles and understands the purposes and the operation of each part of the machine. In the second group of experiments, he covers the same field and adds considerable technical information to his store of knowledge. In the final part, he is given experiments that are largely in the nature of adjustment and repairs, and lead him into an understanding of additional principles.

The book is especially valuable for standard high school courses which are parts of a general industrial arts course of study.

Elements of Applied Physics.

By Alpheus W. Smith. Cloth, 481 pages, illustrated. Price $3. McGraw-Hill Book Co., New York, N. Y.

Educational progress runs in circles, or better, in spirals. The course in physics, of the writer's college days, was a highly technical affair and what relation there was to every day life came not through the textbook but through the allusions of the professor. When science was introduced into the high school and later into the junior high school, it was found that the more immature students could not readily grasp the abstract principles of the subject or relate them to the facts and needs of the home, the shop, the drafting room, and the work place. Accordingly the teaching methods, and later the texts, were of the applied type, and illustrations and experiments were taken from common devices and machines found in the home, in the shop and on the farm. In the present text the author has adopted and adapted the idea to a thoroughly technical book of college grade.

The book is a real physics text, amply broad and inclusive for any general course as well as for courses leading to engineering or other technical work. The conventional order of topics is followed, but there is considerable originality in the inclusion and exclusion of principles and the constant reference to the application from industry, engineering and farming. The mathematical elements are stressed and problems of purly scientific nature and of practical utility are added.

Pictograms, a railroad picture book. Issued by Charles Fitzhugh Talman, Washington, D. C. This little volume contains photo reproductions, done in brown halftones, of railway depots and terminals, switch yards, signal towers, block signals, construction operations, rotary snow plows, wrecking trains, tunnels, bridges, viaducts and ferries.

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NEWS AND NOTES.

Train Apprentices. The Nevada Consolidated Copper Company, at McGill, Nev., has adopted a liberal educational policy governing the acceptance of trained students as shop apprentices.

The junior high school course of study emphasizes vocational education. The first year's work consists of the usual manual training activities. In the first and second years, boys are permitted to specialize in forging, lathe work or electricity. Following the completion of a three-year trade course, boys who do not desire to continue their formal education, are given an opportunity to enter the plant of the company as shop apprentices.

Evening Course in Automobile Mechanics. The Franklin Trade School, at El Paso, Tex., offers evening school opportunities in automobile mechanics. Instruction is free to all mechanics over 16 years of age who are employed in the trade. The following short units of instruction are offered:

1. Re-babbitting of bearings
2. Reboring of cylinders
3. Refacing and reseating of valves
4. Setting timing gears
5. Fitting pistons and rings
6. Rebushing of gears
7. Adjusting differentials
8. Reading wiring diagrams
9. Testing for short circuits
10. Testing and repairing batteries
11. Welding automobile parts
12. Trouble shooting.

Printing Course. The printing department of the Franklin Trade School, El Paso, Tex., offers training in language, spelling, grammar, art, punctuation, mathematics, drawing and science. The high school shop is well equipped to give instruction in all branches of the trade.

Instruction is given in composition, stone work, job and cylinder press work, paper cutting, linotype mechanism and operation.

Work in mathematics, English and drawing is given as related work and is open to students who enroll in the printing classes.

Fifteen year old Antonio Petrucelli of the textile high school, New York City, was awarded a prize of $100 in a recent ribbon competition conducted by Johnson-Cowden-Emerich, a large ribbon manufacturing concern. Another student, Lillian Tyler, was awarded a contract for twenty ribbon designs to be used by Talamberas Brothers for printed fabrics.

The Twin City association of merchant tailors presented a petition to the Minneapolis, Minn., board of education for the establishment of classes in tailoring. The matter was referred to the superintendents for study and report.

The Minneapolis, Minn., board of education has permitted a competition for a $50 prize offered by the 151st Field Artillery for the best radio set constructed by any local high school boy.

Automobile Classes. The university extension of the Massachusetts department of education has introduced evening classes on automobile construction. There will be two classes in Boston, one meeting at six and the other at eight. The course includes a discussion of the essential parts and types of automobiles, as well as a study of the engine, transmission, starting, ignition, and lighting systems. The various types of car, the principles of operation, proper care, and methods of making road repairs will be covered in the course. Emphasis will be laid upon the danger and expense arising from the neglect of worn and broken parts. A portion of each period will be devoted to a discussion of traffic regulations, rules of the roads, and other points which make for safe driving.

The Society of Arts and Crafts of Boston, Mass., awarded the society bronze medal to Emile Bernat, tapestry weaver, Boston; Francis O. Libbey, photographer, Portland, and Edward E. Oakes, jeweler, Boston. The following were elected directors for three years: Llewellyn Seaver, Howard L. Rogers, R. Clipston Sturgis and George C. Greener. C. Howard Walker is the president.

Advise on College Education. For the first time in the history of American education an international labor organization has undertaken the task of advising and aiding its members in securing the best college and university

(Continued on Page XXVI)

The Value of Art Teaching in Public Schools

By James Parton Haney, *Late Director of Art in the High Schools of New York City*

THE art training of the public schools should be a practical training touching closely the needs of the community; it should aim to cultivate taste and apply that taste to the homes, the dress and the business of those it trains.

A mistaken idea is to hold that art is the business only of the artist. As a matter of fact, principles of art touch every individual and are used more or less consciously by all. The housewife must decorate her home. She may use the principles of decoration well or ill, but use them she must, in the adornment of her house, in her dress, and even in the flowers which she plants in her garden or hangs in her window boxes.

The business man cannot escape from the use of art's principles for a single day. If he would "dress" a shop window, get up a circular, design a letterhead, or arrange a newspaper advertisement, he must consciously or unconsciously use the rules which art has devised in design, color and arrangement.

Art is not for "the few". It is for "the many"; for the many have to use it. It is not held that the training of the public schools will produce artists, but it is held that it will raise the standards of taste throughout the community. We cannot have people with high standards without an effect on trade. People who know better things, demand better things. Thus the art teaching of the public schools has a practical relation to the business interests of every community.

Besides this, there is a civic value in art teaching. One cannot raise standards of taste without raising standards of appreciation. The man or woman who strives to make his house better takes pride in having his town made better. Every civic "booster" knows that there is nothing which stimulates the interest and pride of citizens more than a consciousness of the growing beauty of the town in which they live.

Thus the spiritual value of art training goes with its practical value. Many of those who cannot see the spiritual worth can see the practical worth. One of the surest evidences of the broadening realization of this lies in the fact that every progressive community throughout the Union is using art training in its public schools as a means of advancing community interests. The reason is plain. One cannot change, materially, the taste of a people already grown up. To affect these standards permanently, one must begin with the children in the public schools. Art teaching is not a fad, it is an economic question with an economic reward to every community that realizes this and forwards the art work of its schools.

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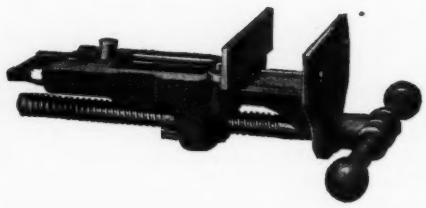

The Columbian line of vises offers the widest variety of types, the most practical and economical vise equipment, that is available for manual training schools.

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Columbian Hardware Company

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CLEVELAND

(Continued from Page XXIV)

education for the sons and daughters of its members. The Brotherhood of Locomotives Engineers' Journal, at Cleveland, which reaches 90,000 workers in this field, has established a department of educational information to give advice regarding advantages, facilities, cost, and entrance requirements of the various institutions. The organization is convinced that labor and the community as a whole, will only prosper in so far as the privileges of education are made easily obtainable for all.

The organization in cooperation with the B. of L. E. Cooperative National Bank, Cleveland, has begun plans for an educational endowment trust fund. By means of this fund parents are encouraged to lay aside a small amount each month toward the education of their children, which the bank will collect and invest to better advantage than the individuals could do it personally. The entire movement has for its purpose the improvement of the status of the individual worker and the promotion of prosperity among the people.

Endow Scholarship. A scholarship fund of $5,000 is being raised by the New York School Art League as a memorial to Dr. James Parton Haney. It is the purpose of the League to make the proceeds from the fund available for continuing the education of talented high school graduates along industrial art lines.

The Elm vocational evening school of Buffalo, N. Y. held its graduation exercises after a dinner meeting during which addresses were delivered by Superintendent E. C. Hartwell, Dr. George E. Smith, deputy superintendent of schools, F. H. Wing superintendent of industrial education and William B. Kamrath, principal of the vocational school.

Better Homes Exhibit. The Industrial Teacher Training Department of the State Normal School, Oswego, N. Y., will hold on June 7, 8 and 9 a Better Homes Exhibit consisting of interesting material illustrating the furnishing and equipment of artistic, convenient and hygienic homes. The exhibits are to include historic period furniture, loaned by a local citizen, school exhibits showing how the schools function to promote good homes, and industrial exhibits of materials, furnishings and mechanical appliances for home use. During the exhibit various addresses and picture programs will be rendered. The committee in charge of the exhibit is headed by Mr. Joseph C. Park, Director of Industrial Training at the Oswego Normal School.

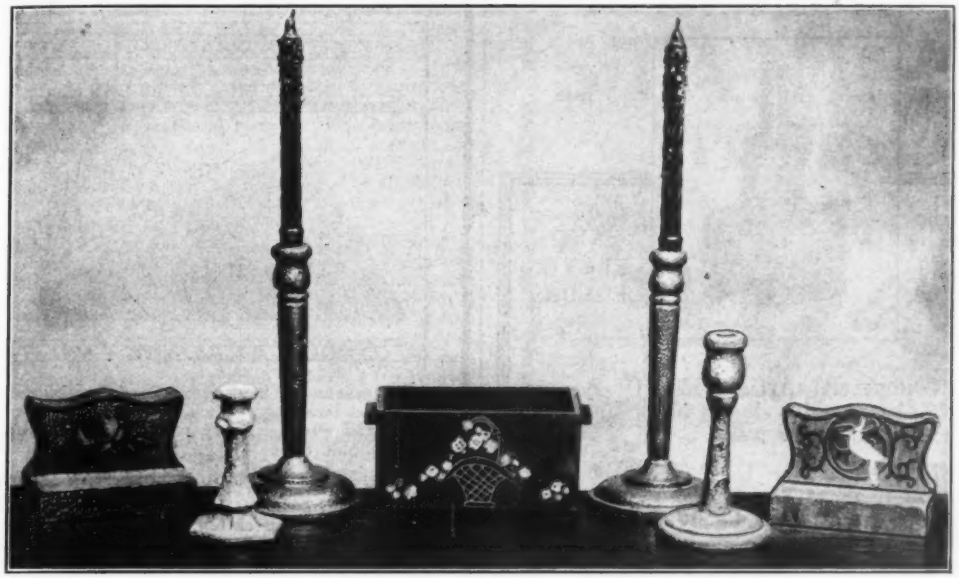
Scholarships for Trade School Men. The state of New York is offering twenty-five industrial teachers scholarships of $1,000 each to qualified trade and technically trained men. The satisfactory completion of the one-year course by scholarship holders will entitle them to secure a life license to teach a specific trade, industrial or technical occupation. The annual salaries paid vocational teachers now range from $1,800 to $3,500 after a period of experience.

The twenty-five scholarships will be awarded to qualified persons who have had at least five years of all round experience of journeyman grade in one of the following trades, industrial or technical occupations: automobile repairing, machine shop work, electrical constructing, repairing and operating, machine drafting and designing, electrical drafting and design, architectural drafting and designing, bricklaying, sheet metal working, painting and decorating, carpentry, printing, including composition, press work and bookbinding, and men's tailoring and garment design.

Need Vocational Objectives and Standards. Accurately defined objectives and standards are needed in vocational education in the opinion of the members of the New York City Vocational Club which held a meeting recently in the Manhattan Trade School Auditorium. The general topic of standards for vocational work was discussed by Louis Marks of the board of examiners, Morris E. Siegel of the evening and continuation schools, Miss Emma Conley of the state education department and Dr. David Snedden of Teachers College, Columbia University.

Dr. Snedden pointed to the changed opinion regarding vocational education during the past fifteen years and to the popular place it has assumed today in the school courses. Every high school in the country now offers one or more lines of vocational work and the problem has now become one of distinguishing between the truly vocational school or course and the superficial imitation.

(Continued on Page XXIX)



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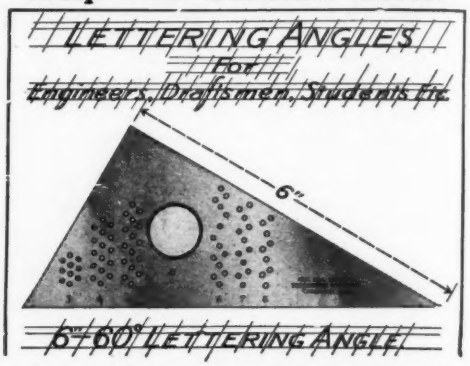

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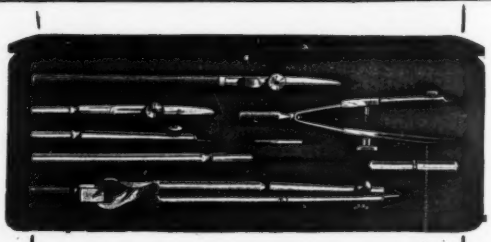

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Dr. Snedden declared that it is essential that school authorities determine the difference between vocational education and other kinds of education. The best way of ascertaining this is by examining the results of the teaching. In a few years, reports will be received from employers of pupils, and then it will be possible to evaluate the work of the continuation and vocational schools.

Mr. Marks in his remarks, showed that there is great variation in the amount of time devoted to vocational courses in different schools. The greatest uncertainty exists among the prevocational schools. The hours vary from three to fifteen per week. Vocational courses, he said, should be made as cultural as possible and the vocational school which does not supply the cultural element becomes narrow. The academic work should be centered about the work in the shop.

Miss Conley urged the need of thorough training in home economics for both elementary and high school students. She decried the practice of offering minimum courses of training in home economics and pleaded for a thorough grounding in the efficient management of the home.

Mr. Siegel urged the exclusion of cultural subjects from the courses of the continuation schools. He pointed out that in the continuation school the last chance is offered to help the employed boy or girl and all energies should be directed to perfecting their training for their lifework. Mr. Siegel is a believer in a minimum of academic instruction and textbooks for continuation schools and in the power and ability of the teachers to plan work adapted to the needs of individual students. Mr. Siegel urged that vocational teachers obtain a thorough training in the principles of economics and sociology in the hope that they may thus successfully master the problems of vocational education.

The Continuation Herald of Central Continuation School of Buffalo, New York, made its bow to the public recently. The first issue contains a greeting by William J. Regan, director of part-time education. in which he states that this first issue will be read by 2,700 pupils of Central Continuation School, that by June 3,000 working boys and girls will be reading it and that by January 1st next year, more than 6,000 pupils will read it. He prophesies that in 1925 there will be 12,000 pupils in Central Continuation School.

School of Printing. A school of printing has been established at Baltimore, Md., in a remodeled school building. The school is operated under the joint direction of the department of education and the Typothetae of Baltimore, and is open the entire year. The building which has been adapted to the use of machinery and equipment for the work, includes space on the first floor for the typesetting machines, press and binding departments. The space on the second floor is devoted to related academic work, to the art department and to a modern printing library.

Both boys and girls are admitted to the school which is also open to employed apprentices who desire to increase their knowledge in the field of printing, to journeymen and master craftsmen desiring specific and expert training. Students receive a certain amount of pay at the beginning of the third year, when they spend half-time in industry and half-time in school.

Organize School Corporation. A corporation comprising boys of the eighth, ninth, tenth and eleventh grades of the Milwaukee Prevocational School, at Milwaukee, Wis., has been organized with $5,000 capital stock in unit denominations of $5.

The stock is issued to the boys upon the completion of forty hours' work in building such of the toys, or other objects, for the manufacture and sale of which the corporation is chartered. The board of control is composed of the principal, B. L. Dougherty, the instructors and four officers elected from among the boys.

Vocational School Supplies Equipment. The pupils of the Smallwood Vocational School, at Washington, D. C., supply all the equipment needed by the schools of the city. Chairs, tables, files, cabinets, iron containers, tin cups and various other types of articles are among the products of the industrial classes of this school.

In this school, the vocational training begins in the kindergarten and continues through the grades to the completion of the eighth grade, when the pupil is fitted to enter a lifework. In the fourth grade, the beginning of specialization is made. The time spent in vocational classes increases as the pupil advances so that in the

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No. 20 Screw Driver. Standard head; blades of standard type, with proportionate tips and handles; handles are fluted and stained black.

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No. 20 "Everlasting" Chisel. Head, Shank and Blade of patented construction, and forged from one piece. Handle of selected Hickory.

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No. 65¾ Marking Gauge. Boxwood; polished brass screw; adjustable point and pencil; face plate.

No. 12 Hammer. Bell face, round neck and poll; curved claw. Made of special steel carefully forged, hardened and tempered. Handle of second-growth White Hickory. Pulling strain comes on body of claw, and not on edge.

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No. 20 Try Square. "Hand-y" Feature, Brass Face Plates; blued blades; edges of blades are machined and are square inside and out. Rosewood handle.

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fourth grade, three hours a week are required. In the seventh and eighth grades, from eight to nine hours a week are required. Actual shopwork begins in the fifth grade, where the pupils average about 11 years of age. In the eighth grade, pupils devote their entire time to the work which they have selected.

Art in the Schools. The board of superintendents of New York City has approved a new course of study in the schools which has for its aim the education of children to appreciate the best paintings. A list of one hundred paintings has been prepared, reproductions of which will be used in connection with the course.

The pictures are to be grouped according to the grades in which they will be exhibited. The grouping shows a finely cultured intelligence. The older children will have modern works of art interpreted for them. The purpose of the work is to cause the children to understand the most profound influence behind all that is significant in the art of today.

TRADE PUBLICATIONS.

Simonds File Catalog. The Simonds Saw and Steel Co., Fitchburg, Mass., has issued a new catalog of steel files. The booklet contains 26 pages devoted to descriptions and illustrations of different files, showing varying lengths and thicknesses and the special use to which each file is adapted.

The firm manufactures files of uniformly high grade in cutting qualities, temper and shape. They are quick, accurate and economical in use and are guaranteed for long use.

Information concerning the Simonds files may be obtained by addressing the company at Fitchburg, Mass.

A New Oliver Saw. "Oliver No. 16" is the trade name of a unique band saw just marketed by the Oliver Machinery Co., Grand Rapids. The saw is a standard 36 inch saw for heavy duty, fitted with tilting table and frictionless band saw guide. It altogether exclusive feature is the motor-on-shaft drive, wherein the motor is built in directly on the lower wheel shaft, giving an enclosed, silent and entirely self-contained drive. The arrangement is of more than passing interest as a logical, efficient development in machine design. Complete, illustrated circulars are available for teachers.

Blue Printing Machinery. The firm name Pease is synonymous in the minds of American draftsmen, with blueprint machinery of the highest quality. In fact Pease blueprint equipment and drafting room supplies enjoy an enviable reputation wherever American drafting products are used. The firm has just issued a new catalog, M-23 devoted entirely to the various types of Pease-Peerless blueprinting machines. Pease vertical blueprinting machines, sheet washers, blueprint lamps, dryers, trimming tables, papers and other accessories. The catalog is fully illustrated and contains complete specifications and directions for use.

An important new product listed in the catalog is the Pease-Peerless arc lamp for blueprinting, which is adapted to a wide variety of conditions of electric current, etc.

PERSONAL NEWS.

Dr. Robert J. Leonard has been appointed Director of the School of Education, of Teachers College, Columbia University, succeeding Mr. Paul Monroe. Dr. Leonard comes to Teachers College from the University of California where he has been Dean of the School of Education and assistant in charge of University relations.

Dr. Leonard was formerly a teacher and supervisor in the schools of California; for two years he was instructor and supervisor of industrial arts in the Horace Mann and Speyer Schools connected with Teachers College; he was for two and one-half years professor of vocational education at Indiana University and was for three years regional agent for the Federal Board of Vocational Education. During the past five years at the University of California, Dr. Leonard has specialized in university and college administration. Dr. Leonard holds the degree of bachelor of science and master of arts given by Teachers College.

Mr. Kenneth R. LaVoy, of Hudson, N. Y., has accepted a position as instructor in carpentry and industrial work at New Rochelle.

Dr. Samuel W. Stratton, president of the Massachusetts Institute of Technology will be formally inaugurated June 11th, with the pomp attendant upon a function of this nature, including full academic dress.

William L. Judkins, who was at the head of the Newton technical high school died at his home Newtonville, Mass., on April 6th at the age of sixty-one.

A general view of the Printing Department of the Seymour Vocational School, Newark, N. J.

The Kelly Automatic Press, a machine that produces the finest kind of printing at a speed of 3,500 impressions per hour.

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Boys, the sizes and ages shown, are not interested in a subject that doesn't appeal to them. Printing fascinates most boys. It teaches them the use of punctuation marks, the making of proper margins, the use of good English, correct spelling, capitalization, and indention in an accurate manner.

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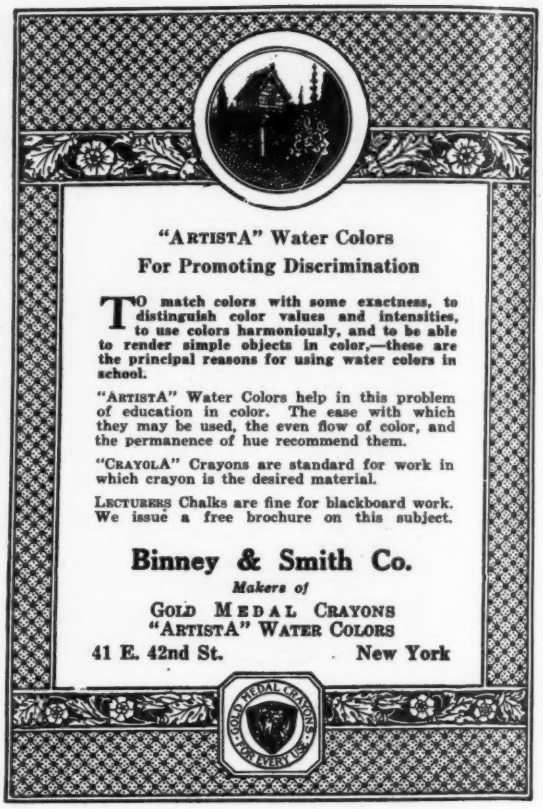
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Men may grow even in a young country, and the individual business enterprise, too, may endure for many years, but longevity in either case is due to some meritorious causes—causes which may well engage our attention and not infrequently our admiration. Thus we note the fact that the firm of Hammacher, Schlemmer & Company of New York City has with this year reached the seventy fifth mile post of its existence, and very appropriately commemorates the event in a handsome brochure—a brochure that is something worth while. Let's look it over.

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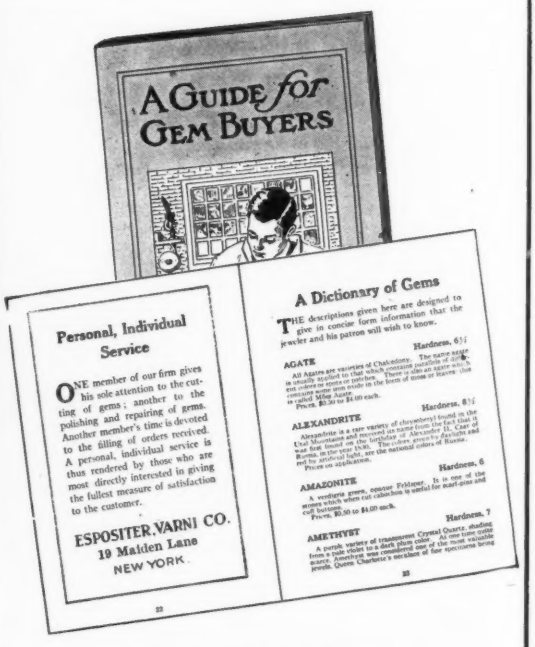
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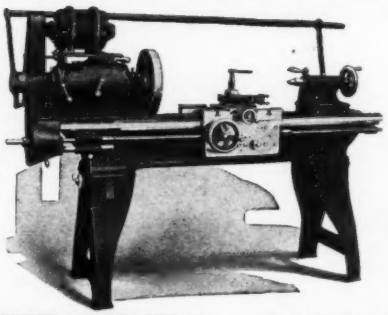

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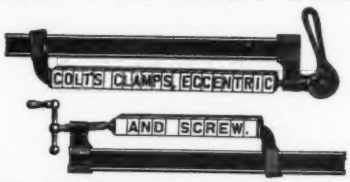

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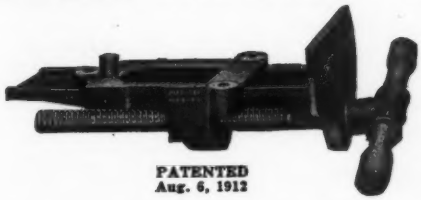

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Starrett Co., L. S.
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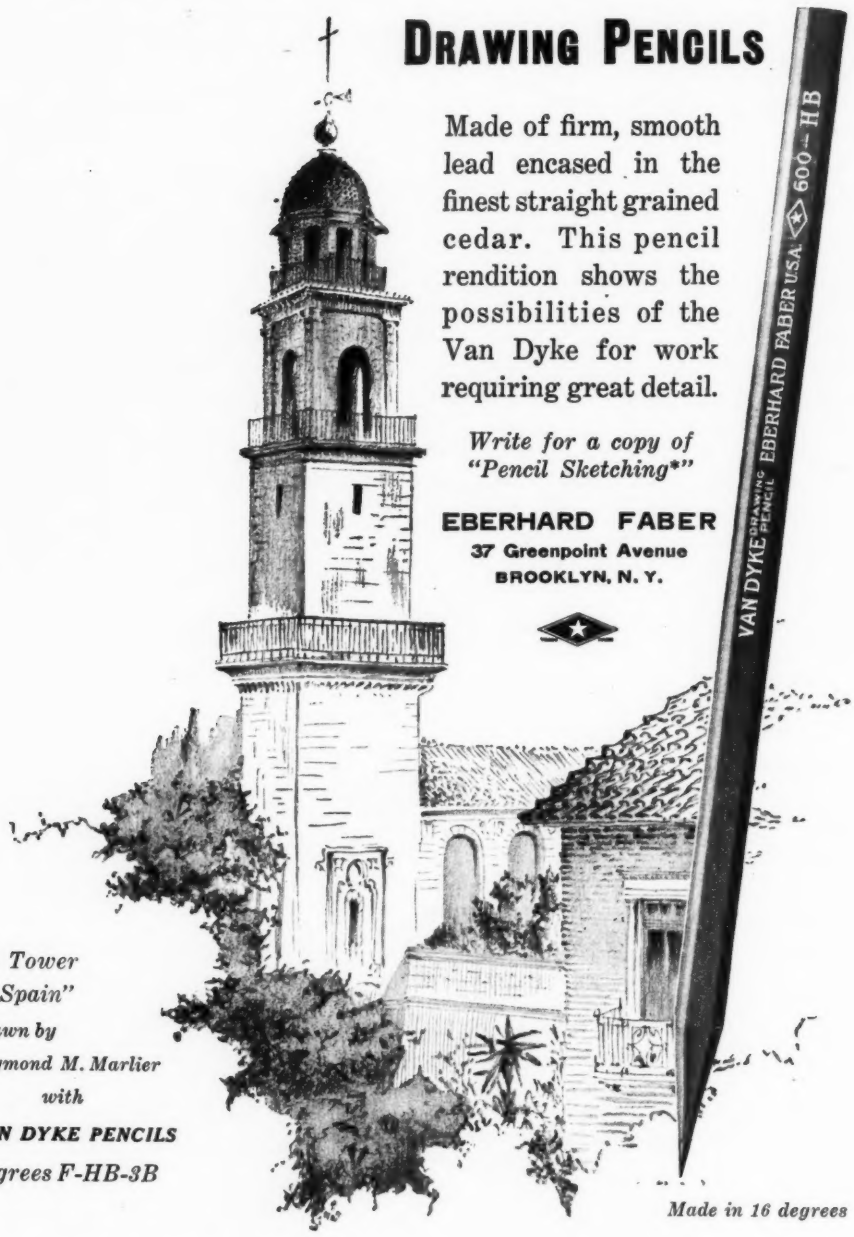

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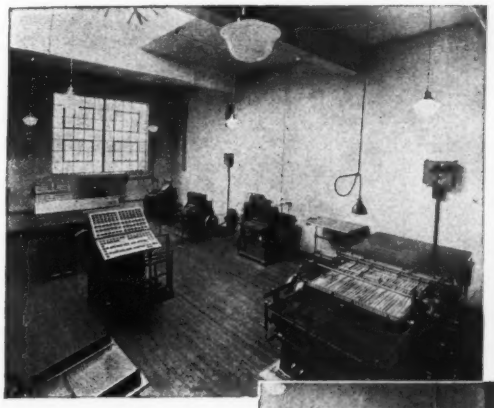

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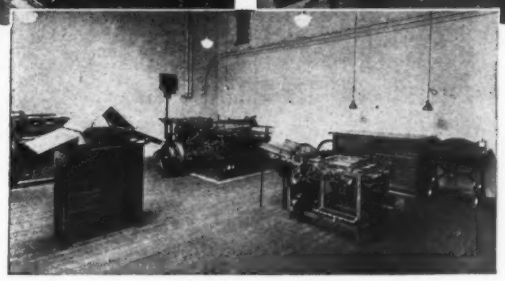

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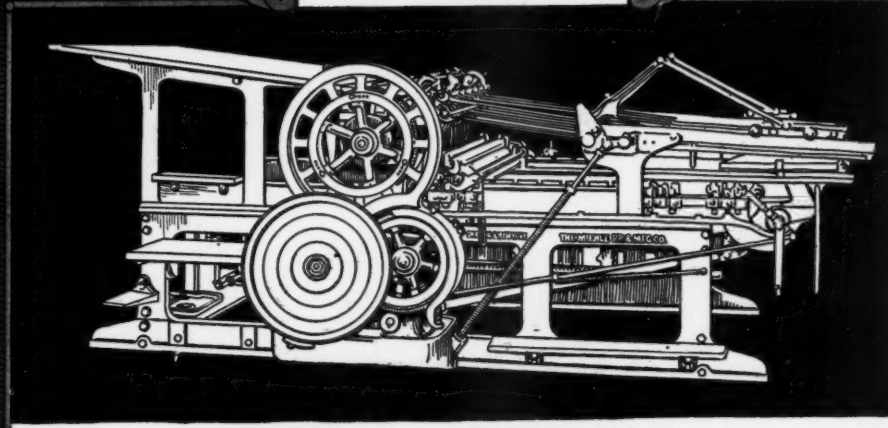

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